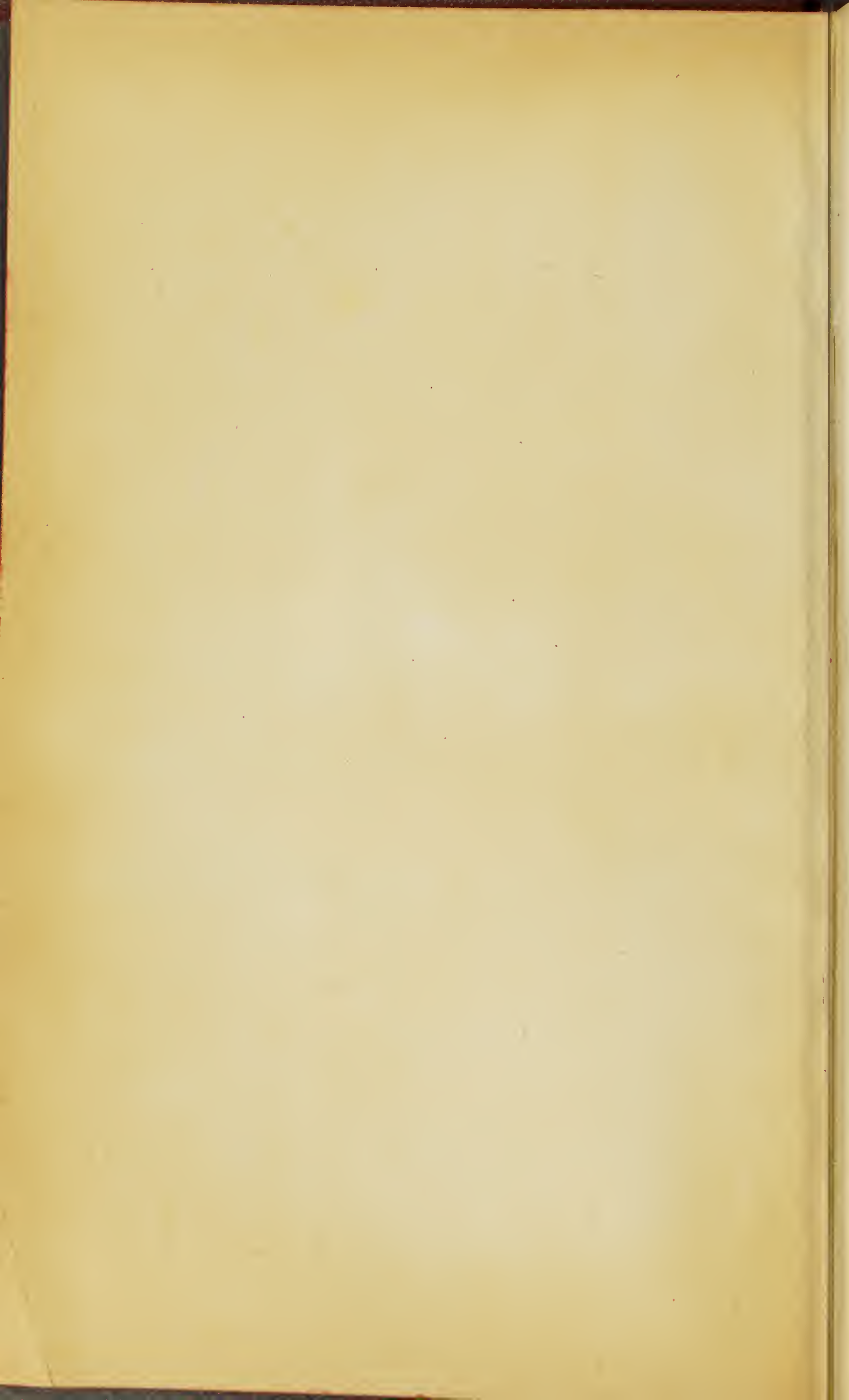


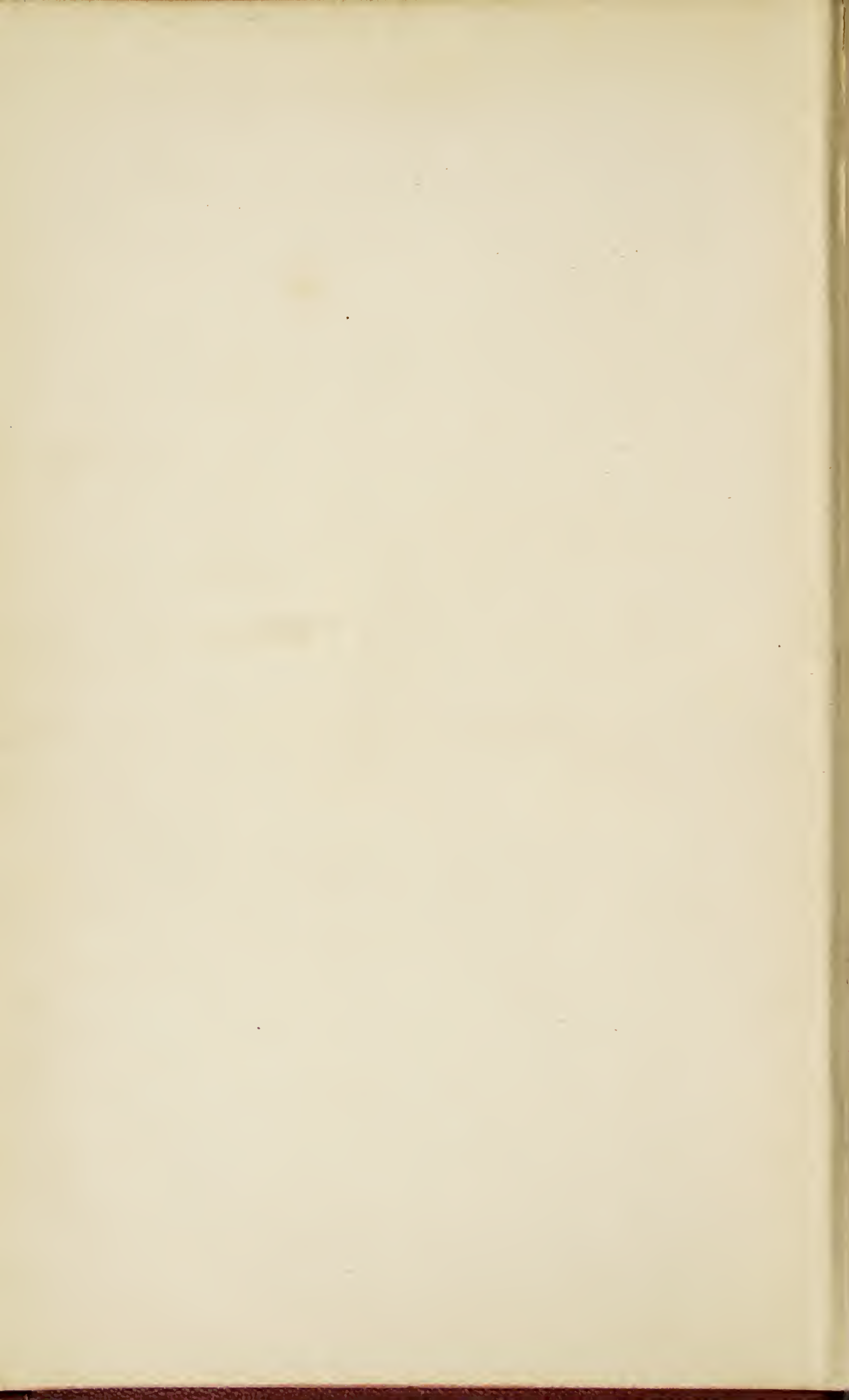


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PRACTICAL MANUAL OF
DISEASES OF WOMEN
AND
UTERINE THERAPEUTICS



PRACTICAL MANUAL
OF
DISEASES OF WOMEN
AND
UTERINE THERAPEUTICS

For Students and Practitioners

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NINTH EDITION



IN TWO VOLUMES

VOL. I.

LONDON:
BAILLIÈRE, TINDALL AND COX
8, HENRIETTA STREET, COVENT GARDEN
1904

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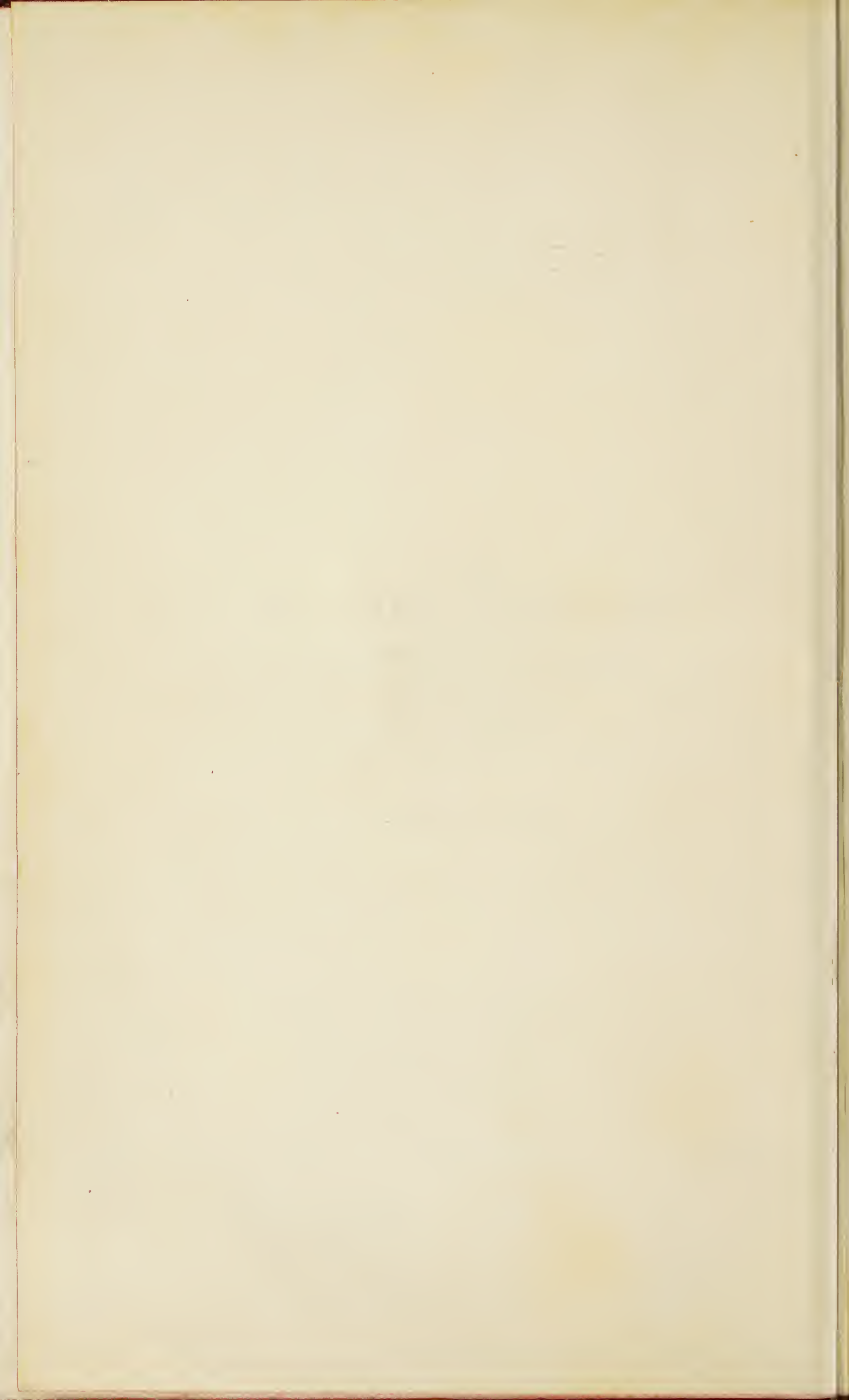
To
THE MEDICAL GRADUATES

OF THAT UNIVERSITY WITH WHICH HE WAS,
FOR A PERIOD OF TWENTY-TWO YEARS, CONNECTED, EITHER AS
STUDENT OR TEACHER,

THIS BOOK IS INSCRIBED

BY

THE AUTHOR.



PREFACE TO THE NINTH EDITION.

THE present edition of this work, appearing for the first time in the *University Series* of its Publishers, has been practically rewritten. Many additions were also necessitated by the clinical, operative, and pathological advances which have been made in the subject during the last few years. The endeavour has been to bring the book into line with the most important of these advances, up to, and including, the present year.

The aim is not, and never has been, to place in the hands of students or practitioners a superficial and sketchy summary of the subject. Rather has it been the author's object to give a reliable digest of practice, and at the same time to embrace those pathological researches on which alone a sure foundation of clinical treatment is based. The forecast made in the first edition, written in 1884, of the attitude of the well-educated practitioner of the future in regard to the management of his gynæcological cases, has been more than fulfilled. Extended courses of study, residence in special hospitals, and post-graduate instruction have helped to strengthen this tendency to independence of action. Yet it may not be out of place here to remark that there is a grave and unavoidable responsibility attached to the performance of certain gynæcological operations, among which are some of the most serious and difficult in the entire domain of operative surgery. These latter require in the operator, not only all the instincts of the surgeon, but also a wide and varied experience in the field of pelvic surgery. The senior student and the young graduate or diplomate who are devoting themselves to the

study of certain special branches with a view to making these the fulcra by means of which they may advance themselves in their profession, are not satisfied with any surface knowledge. Therefore this manual is not an expression of the author's personal experience and views only, though both these, and his own methods of treatment and operative technique, are fully given. So far as is practicable, the teachings of many of the most distinguished and reliable of modern gynæcologists are referred to.

I am much indebted to several home, Continental, and American colleagues for the generous manner in which they have accorded me permission to use their illustrations, and, in several instances, have given me cliches. Of these I have to specially thank Sir Halliday Croom for his generous gift of the three coloured plates of chorion-epithelioma; and Mr. Teacher also, for the photographs which appear in the same chapter, and for his valuable advice in the writing of it. Dr. Howard Kelly, with his characteristic liberality, placed any or all of his hitherto published illustrations that I might desire to use at my disposal. Professor Bumm (Berlin) kindly sent me some original drawings, and accorded me permission to use some of his plates, from his magnificent work, in the chapter on extra-uterine pregnancy, which has been rewritten under the capable hand of Mr. Frederick Edge (Wolverhampton), and further enhanced by Mrs. Mary Scharlieb through her most interesting illustration of early tubal rupture. Dr. Pincus (Dantzic) has favoured me with cliches from his work on 'Atmocausis and Zestocausis.' To Dr. Murphy (Chicago) I am under an obligation for the assistance derived from his comprehensive brochure on 'Tuberculosis of the Female Genitalia,' and to Dr. Comyns Berkeley for the facts collated by him in his paper on the same subject. In the revision of the chapter on the rectum, I have had the assistance of my friend and coadjutor, Mr. Charles Ryall. For pathological reports, I have to reiterate my acknowledgments made in previous editions to Mr. Targett. In this one I am particularly indebted to Dr. Cuthbert Lockyer and Mr. Sampson Handley; also to Dr. Eastes for the preparation of specimens, macroscopical and microscopical. Through the courtesy of Drs.

C. J. Cullingworth and T. W. Eden, I have been enabled to pourtray the rare condition of hydatid of the ovary and Fallopian tube.

To many Continental friends, from whom I have received both courtesy and kindness while visiting their clinics, I take this opportunity of tendering my thanks. Much that appears in this work is due to the experience gained through those visits. If I particularize the *Frauenkliniks* of Professors Olshausen, A. Martin, Paul Zweifel, Schauta, Chrobak, Winckel, Gustav Klein, Leopold, Kleinhans (the successor of the illustrious Säger), Krönig and Menge, Bumm and Schultze, it is because in these I have had more ample opportunities of seeing the details of their different techniques.

Through the journal of the British Gynæcological Society and that of Obstetrics and Gynæcology of the British Empire, I have obtained material that otherwise I could not have hoped to secure. The summary of the subject in the former journal, by its editor, Dr. J. J. Macan, I have freely availed of. All excerpts and references are duly noted throughout the pages of the work.

In passing this work through the press, I received material assistance from Dr. S. Jervois Aarons, who read all the first proofs; while the labour of correcting revises, compiling the index, the lists of illustrations, and the names of authorities, was undertaken by another friend.

The greater number of the plates throughout the work were drawn by Mr. S. A. Sewell, and faithfully delineate the pathological conditions they represent. Messrs. Arnold & Son have provided me with several new engravings of appliances, executed especially for this edition. As hitherto, my publishers have spared neither trouble nor expense in the production of the book.

H. MACNAUGHTON-JONES.

131, HARLEY STREET, W.

October, 1904.



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DISEASES OF WOMEN.

CHAPTER I.

ANATOMICAL AND CLINICAL.

Summary of Anatomical Facts which have a Bearing on Gynæcological Diagnosis and Practice.

It is outside the scope of this work to enter into a detailed description of the female pelvic organs and their relations. There are some simple anatomical points connected with the female organs of generation that must, however, be remembered by every student and practitioner, and which have an important clinical bearing on the examination and conduct of a gynæcological case. It is necessary, in the first place, very briefly to allude to these.

Vulva (Fig. 1).—The vulvar orifice is elliptical in shape, and comprises the mons veneris, labia majora, labia minora, clitoris, meatus urinarius, vestibule, fossa navicularis, fourchette, and hymen. It varies in size in different individuals. In some women the vulvar opening is contracted. Both its size and elliptical shape influence us in the choice and method of introducing a speculum in the virgin and in sensitive women. Occasionally there is complete atresia of the vaginal orifice. The sebaceous follicles on the inner surfaces of the labia, with the adjacent mucous membrane, offer to all contagious secretions a large surface for the retention of fluids, septic particles, or any specific virus. On the vulva or vulvar orifice we occasionally find, in unhealthy states of the system, aphthous and gangrenous sores, specific ulcers, purulent discharges; in children, noma vulvæ. Its exposed position renders it specially liable to injury, either from accident or violent intercourse. Owing to the apposition of its mucous surfaces, the irritation produced by friction during exercise,

or, in inflammatory states of the vagina, by unhealthy discharges, causes a sense of heat, and other symptoms of vulvitis. During the exanthemata, in puerperal and other fevers, such as smallpox, measles and scarlatina, the vulva is occasionally inflamed. The predisposition of the follicles and mucous membrane to inflammation, their occasional exposure to irritating secretions, the effects

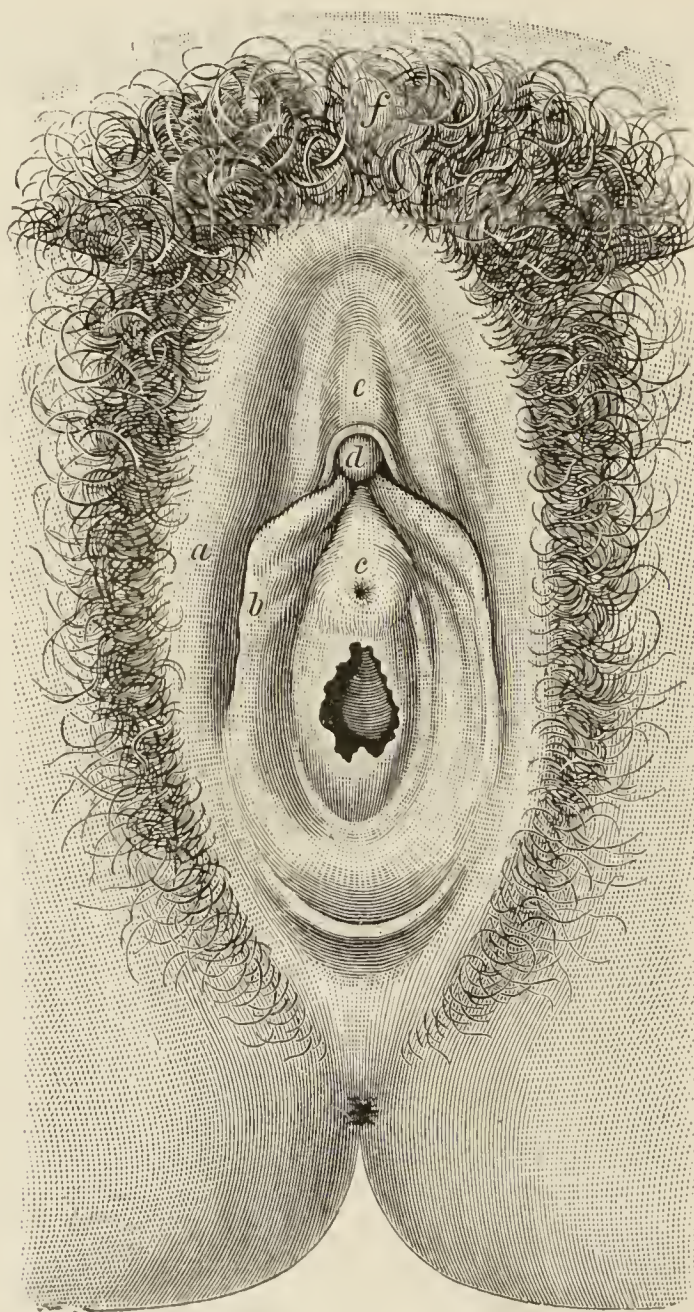


FIG. 1.—THE VULVA * (SHARPEY).

a, Labia majora; *b*, Labia minora; *c*, Meatus urinarius; *d*, Glans clitoridis;
e, Clitoris; *f*, Mons veneris.

of uncleanness and injuries, and the abundance of cellular tissue found under the mucous membrane, afford a ready explanation of the frequency with which phlegmonous inflammation attacks the vulva. This bulbus vestibuli with its erectile tissue corresponds

* Contrast this drawing of the normal virgin outlet with that of the relaxed vaginal outlet in the chapter on 'Ruptured Perinæum.'

with the bulb of the male urethra. Beneath the labia is the vascular bulbus hirudiniform body, the bulb of Kobelt, which is composed of a large plexus of veins. In front of the bulb is another smaller plexus at each side, the *pars intermedia* of Kobelt, corresponding to the part of the male corpus spongiosum urethræ between the bulb and the glans. In this anatomical arrangement we have an explanation of pudendal hæmorrhage and thrombus. I have seen fatal hæmorrhage follow from malignant ulceration of one labium, notwithstanding that every means of treatment was employed. The large vascular supply of the vulva explains, also, the occurrence of septic absorption and septicæmia, which result from injuries and abscess of the vulva, or from the breaking down of a thrombus and the exposure of coagula. It is thus evident that cleanliness is the first essential of treatment in any case of vulvar inflammation. Careful asepsis is indicated when any incisions are made in vulvitis. The vulvo-vaginal gland occasionally has its duct occluded, and over-distension of the duct may follow, with arrest of secretion and inflammation of the lining membrane spreading to the gland, abscess in the gland, or hyper-distension of the gland and the formation of a cyst. The presence of a defined tumour at either side of the vulva, painful and fluctuating, varying in size from a large nut to a pigeon's egg, is fairly characteristic. The analogy of the labia to the male scrotum is obvious. As the loop of intestine descends with the spermatic cord in the male into the scrotum, so it passes with the round ligament to the labium in the female. Care must be taken not to mistake a painful hernia of the labium for an abscess. Unless there be strangulation, the hernia returns with the horizontal posture and pressure. The obliteration of the canal of Nuck explains the rarity of inguinal hernia in the female as compared with the male. It is necessary to bear in mind the contingency of a hydrocele of the round ligament.

A lady came for 'removal of a tumour.' I expressed the opinion that it was a hernia. Another surgeon subsequently pronounced it to be an encysted hydrocele of the left round ligament. I was, in the course of time, suddenly called to see this patient. The bowel had ruptured. I made an artificial opening, and she recovered. Another swelling afterwards came in the right groin. This proved to be a piece of strangulated gut. She was again operated upon, and was getting on well, when a gross imprudence in diet induced peritonitis, of which she died.

The Clitoris, the homologue of the penis, is situated at the commencement of the vestibule, half an inch behind the anterior

angle formed by the labia. It may be hypertrophied, or the seat of a sarcomatous, carcinomatous, or cystic growth. It can be avoided in digital examinations by keeping to the rectal wall of the vagina, and, when passing the catheter, by arriving at the meatus through the guide afforded in the cord-like feel of the urethra. Masturbation leads to many forms of nervous mischief in women. The operation of clitoridectomy for various disorders of the nervous system, more especially epilepsy and hystero-epilepsy, brought on by masturbation, is not an accepted operation in this country. Rather must we combat the habit by judicious moral means, with healthier mental and physical occupations and enjoyments. Even if we do not lead the patient to believe that we suspect the vice, we must give her to understand that any undue excitement of the external organs of generation is most pernicious, and likely to be followed by disastrous results. Next to masturbation, too frequent medical examinations are to be condemned, especially in that type of woman, of the neurotic temperament, who can ill conceal her feelings.

The Urethra.—The shortness of the female urethra saves the woman the penalty paid for every additional inch in length of the male canal. Its dilatability admits of digital exploration of the bladder, after sufficient dilatation with a uterine dilator. In dilating the urethra, as pointed out by Simon, a dilatation of 2 cm. is sufficient to enable us to introduce the index-finger into the bladder. I always prepare the way for the finger by the previous passage of my graduated dilators.

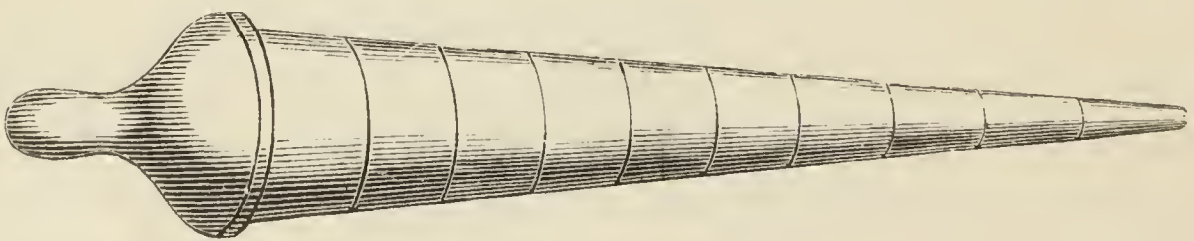


FIG. 2.—KELLY'S URETHRAL CALIBRATOR.

The lines indicate the diameter in millimetres.

Howard Kelly uses a urethral calibrator for exploring the bladder in his method of endoscopy and for catheterization of the ureters.

'The calibrator is pushed into the urethra as far as it will readily go, and the marking of the meatus is noted.' This indicates the calibre of the dilator to be first introduced. 'The average female urethra,' he says, 'can be easily dilated up to 12 mm. in diameter, with only a slight external rupture. I have never seen a tear more than 2 or 3 mm. in length, and from 1 to 1½ mm. in depth.'

In introducing the finger, it must be borne in mind that the

safety with which it is done depends upon the size of the digit of the operator, and also on the care and gentleness with which it is inserted. I have never had any permanent bad results from such combined instrumental and digital exploration of the bladder. Dilatation renders litholapaxy (Bigelow's operation), or lithotrity, comparatively an easy operation in the woman. We need never experience any difficulty in relieving the female bladder. Any short tube over 3 inches long, which has been disinfected, will successfully accomplish the necessary operation, if we happen to forget our catheter.

Any little warty growth above the nymphæ or urethra should demand our attention, also any discharge pouring from its orifice. In ordinary vaginitis the orifice of the urethra has not generally an inflamed, pouting appearance, as it frequently has in gonorrhœal inflammation. Caruncle, warts, tumours, and hypertrophied states of the nymphæ occasionally occlude the orifice of the urethra.

Skene's glands are two mucous-lined tubules, branched at their distal ends on the free surface of the urethral mucous membrane inside the labia of the meatus urinarius. Their branched upper ends terminate in the muscular walls of the urethra. Howard Kelly has specially studied the histology and function of these glands, showing that they furnish a lubricating fluid 'for protecting the delicate mucosa from harmful attrition.' These tubules are well inside the small protection folds of the labia urethræ, and can be felt on palpation lying parallel to the urethra. By compression their secretion can be expressed. Their minute orifices are visible, and can be explored by a fine probe, or fluid may be injected. The glands may be attacked by simple catarrhal or suppurative inflammation. They are specially liable to attack from gonorrhœal infection and any purulent discharge in cystitis.* Howard Kelly agrees with Max Schüller in regarding the tubules as true glands. (See also chapter on 'Affections of the Urethra.')

The Vagina.—This canal measures from $2\frac{1}{2}$ to 3 inches along its anterior wall, and $3\frac{1}{2}$ to 4 inches posteriorly, varying in length in different women, and in the virgin and multipara. It is narrower below and above, and is very distensible in women who have borne children, widening at its uterine extremity. It is enclosed at the sides by the levatores muscles. Its dilatibility in atonic states of the vagina explains the large accumulation of gas or fluid that

* 'Labia Urethræ and Skene's Glands,' by Howard Kelly, M.D., *Amer. Med.*, vol. vi., Nos. xi. and xii., September 12, 1903.

collects in the canal. The lower end is surrounded by the striated muscular fibres known as the sphincter vaginae. An illustration of these facts is afforded by the forcible and audible expulsion of air which occurs occasionally after a woman has been in the genu-pectoral position. The muscularity and elasticity of its walls are shown by the inherent power that the vagina possesses of expelling its

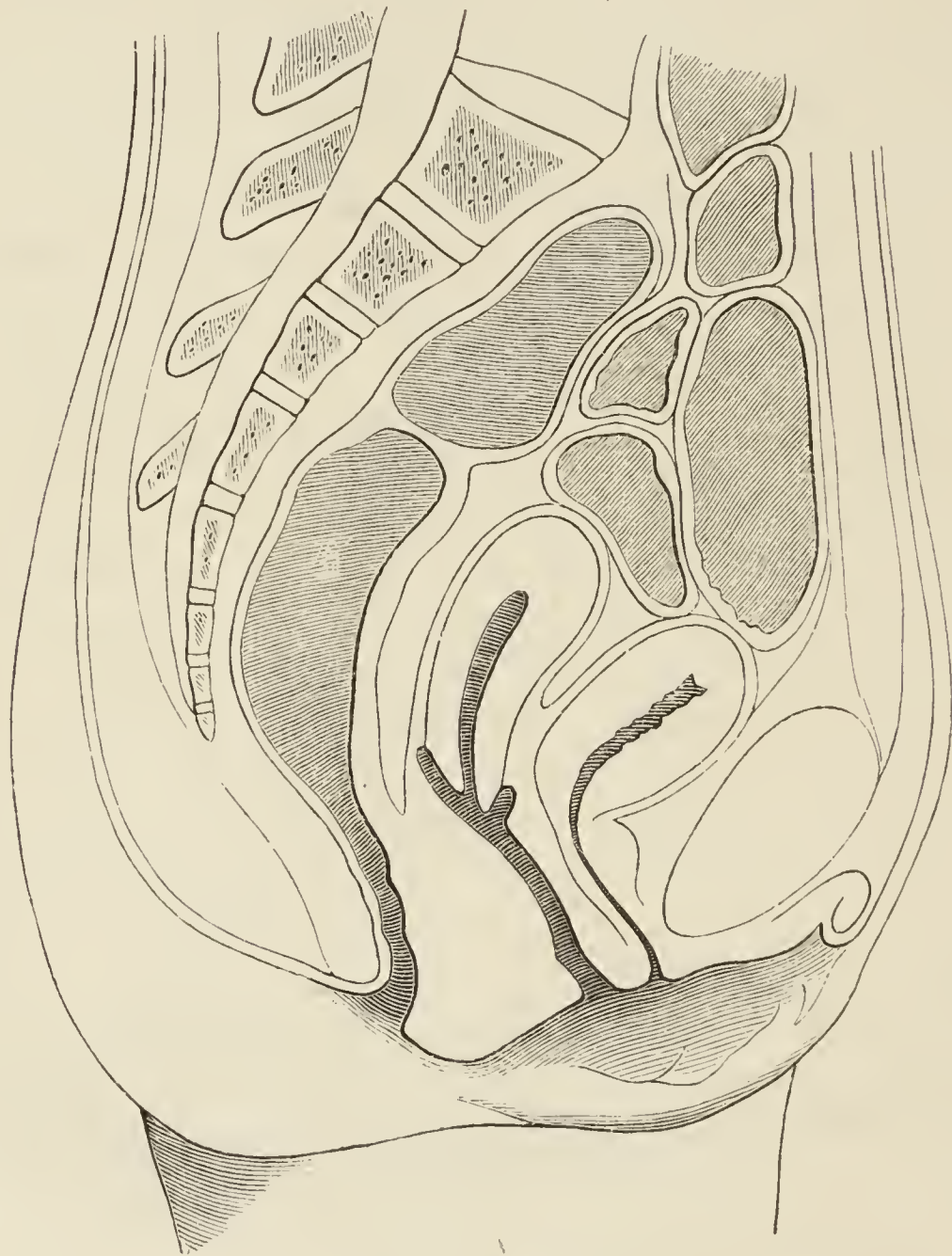


FIG. 3.—SECTION OF THE BODY OF A WOMAN, AGED TWENTY-FIVE, SHOWING THE PELVIC VISCERA AND PERINEUM. (FROM 'ATLAS OF DESCRIPTIVE ANATOMY.' AFTER HEITZMAN.) *

contents; as, for example, expulsion of the after-birth, the speculum, or physometrous collections.

The columns and rugæ which project from the vaginal walls give cover to leucorrhœal and other discharges. We speak familiarly of the anterior vaginal and posterior vaginal fornix—important recesses,

* The uterus here is in a displaced position, one of impending retroversion (see Fig. 13).

or *cul-de-sacs*, in front and behind the uterine neck, needing careful exploration in digital examinations. The vagina is materially influenced by the acts of respiration, being depressed during inspiration, rising again during expiration. The position of the bladder, the distension of the rectum, the state of the superincumbent viscera, and pressure on the abdominal wall, all affect the vagina. The dense bed of cellular tissue which unites it to the base of the bladder, and, still lower down, and more intimately, to the urethra, affords a clue to the associated movement of the bladder, uterus, and vagina. Its connection posteriorly to the rectum, through the peritoneum above and loose cellular tissue inferiorly, explains a similar association of the movement with this viscus, though in a less degree. We have thus an elastic muscular tube,

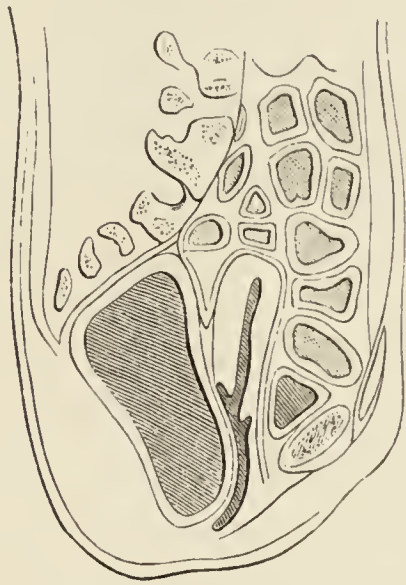


FIG. 4.—FROM BRAUNE, SHOWING DISTENDED RECTUM AND EMPTY BLADDER (PIRAGOFF'S SECTION).

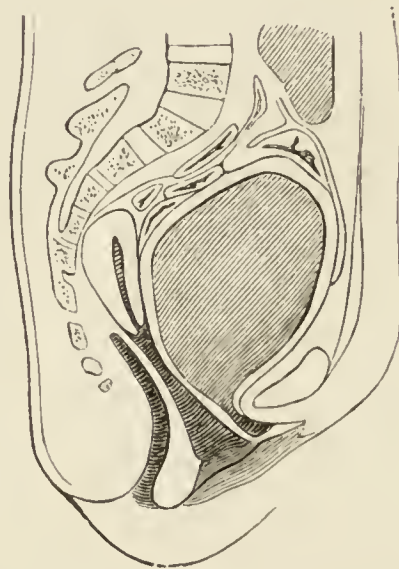


FIG. 5.—FROM BRAUNE, SHOWING DISTENDED BLADDER (PIRAGOFF'S SECTION).

influenced on all sides by the surrounding viscera. It has connected with it an organ whose weight and position periodically vary, subjected to much the same influences from its surroundings as the vagina itself, and by which it is in great measure supported. The only sound clinical view to take of the vagina is to regard it as the important link of union between the uterus, rectum, and bladder, while forming, with the perineal body, a support for the uterus inferiorly. Its muscularity further endows it with this supporting power. The terms 'canal' and 'tube' are apt to give the student an erroneous impression. In old multipara, in cases of procidentia and uterine displacements, or when there are abnormal states of the bladder or rectum, the vaginal walls at the fundus may be separated. We have, however, only to watch the passage closing

after an ordinary examination, or to feel for ourselves—by the introduction of the finger—the close apposition of the vaginal walls, to be convinced that the normal condition of the vagina is one of complete closure. Two most important purposes are thus effected. Greater support is obtained for the uterus above; the entrance of putrefactive elements is prevented from below. In atonic states, when the muscularity of the vaginal walls is lost, we lose much of this advantage; the uterus sinks, and if, as unfortunately is often the case, the perineal body also suffers, being deficient in tone and vitality, or injured by parturition, the uterus becomes still more displaced, dragging with it the anterior vaginal wall, which in its turn descends, and we have the first stage of the subsequent procidentia or prolapse. These clinical results are all intensified by the relaxation of the utero-sacral ligaments, these most important supports preventing both retroversion and prolapse. Frequently, with so-called ‘supports’ or pessaries, these baneful results are encouraged, and vaginal uterine support is weakened. *I speak of their misuse and inaccurate application.* Perhaps no gynæcological appliance is still more commonly abused than a pessary. To fix a rigid and *immovable* bar or ring in the normal vaginal passage is essentially barbarous and unscientific. Yet this is still done from ignorance of the first principle of a uterine support, until we occasionally have to cut it out of the vaginal wall, in which it has formed for itself a bed.

I once removed with much difficulty a huge vulcanite ring pessary from the vagina of a patient who had worn it without removal for five years, and also a rubber Hodge which had remained in the vagina over eight years. The latter was encrusted with hardened mucus and calcareous particles. The entire vaginal cervix was deeply eroded.

The vast extent of the mucous membrane of the vagina explains the difficulty of curing vaginitis, and the severity of gonorrhœal inflammation in the female. Its folds and rugæ afford hiding-places for secretion and impure discharges. Its numerous vascular papillæ (with their investing epithelium removed), at first congested and prominent, finally become hypertrophied and granular.

Influence of Posture on the Vagina.

The influence of posture on the vagina is of importance. In the dorsal position the vagina remains closed; hence after many operations we prefer to keep the woman in this position for a certain time. I am still of opinion

that, consistently with the obvious relief that occasionally allowing her to turn on her side affords, the dorsal decubitus is the safest post-operative position. In a dorsal examination we elevate the hips while the patient is in this position, so as to open the vagina and relieve it of the superincumbent weight of the abdominal viscera. We take advantage most effectively of gravity in the knee-elbow, or genu-pectoral, position: the woman converts her elbows, chest, and knees into a form of tripod (Fig. 6). The hips and buttocks are thus raised, the viscera are thrown downwards and forwards

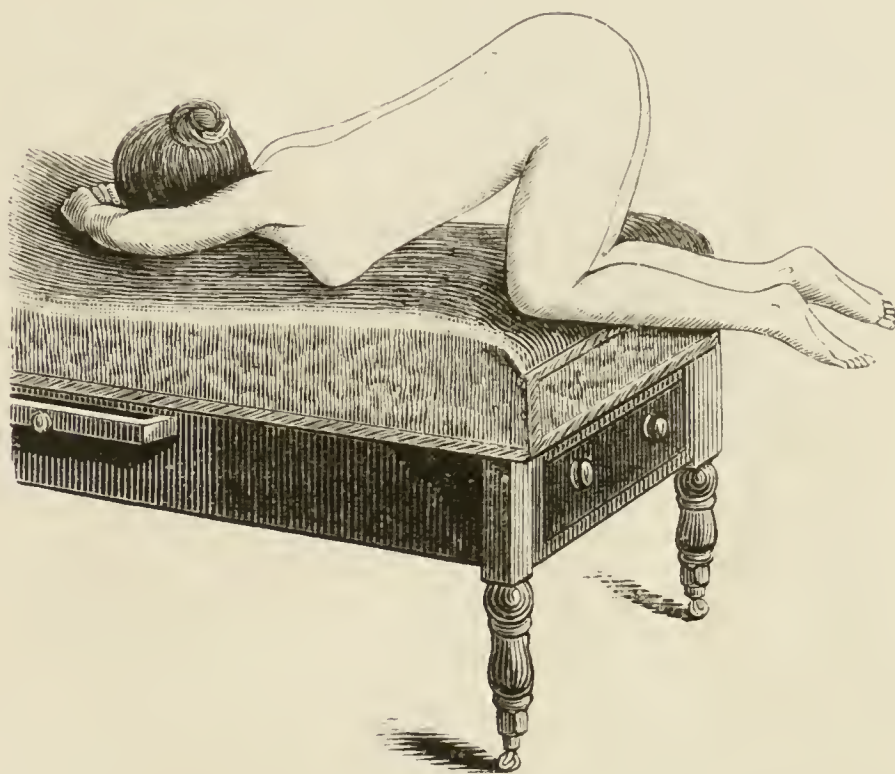


FIG. 6.—POSITION OF THE BODY IN THE GENU-PECTORAL POSITION.

The thighs should be separated more than is shown in the drawing.

the ovaries (Goodell) 'are put to bed.' It is the position we avail ourselves of in some vaginal operations, especially for vesical, rectal, and uterine fistulæ. It is also that to be selected in certain cases of retroversion during replacement of the organ, and should be adopted periodically by the patient after this has been effected. In it the vaginal walls separate, and most readily open when the examining finger is inserted. There is also the mechanical pressure exercised on the uterus and vaginal walls by the imprisoned air which accumulates in the vagina during manipulation in this position.

The Hymen.—I have seen one case where the hymen was rigid and unruptured, only a very small aperture existing, and still the patient became pregnant. This only establishes the well-known fact that penetration is not necessary for the act of conception to take place. Often this thickened hymen causes trouble after marriage and demands interference. In most cases the passage of an expanding speculum or the solid glass dilator, the patient being under an anæsthetic, will quickly rectify this defect. In others,

resection of the hymen as a preliminary step is required. After such forcible rupture and dilatation the dilator is passed daily, or is used as a vaginal rest and kept with a T bandage in the vagina for a few hours at a time. Frequently in such cases there is an

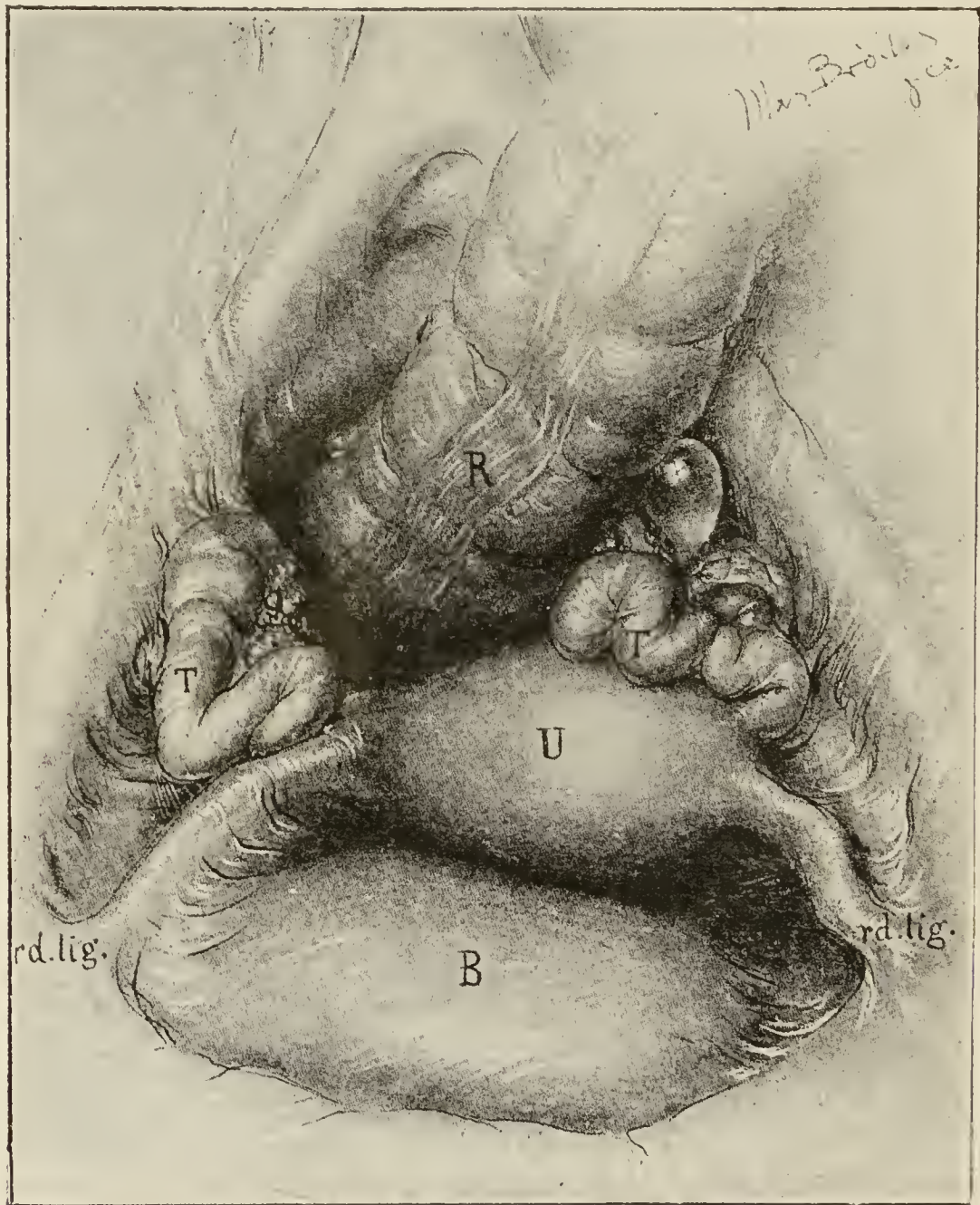


FIG. 7.—VIEW OF THE VISCERA IN THE INLET OF PELVIS FROM ABOVE.
(FROM HOWARD KELLY.)

irritable condition of the vaginal orifice, and some slight vaginitis present. The more serious condition, 'imperforate hymen,' is dealt with in the chapter on 'Atresia of the Vagina.'

When a young girl at the age of puberty, who has never menstruated, is brought to us complaining of ill-defined abdominal pains, and, it may be, some attendant constitutional symptoms, we should always satisfy ourselves that there is no atresia of the vaginal passage nor any occlusion of the vulva. Now and then we meet a case in which rigors have occurred, and there is high temperature, with rapid pulse, severe abdominal pain, local tenderness, and

distension, or the physical signs of a tumour present. Here, with an imperforate hymen, we may suspect peritonitis, colpo-hæmatoccele, and the greater danger of septicæmia.

Abnormalities in the Hymen: Folding Hymen.

At the British Gynæcological Society, I brought forward the question of the condition of the hymen as evidence of virginity or chastity. The following variations in the nature and shape of the hymen have been described by Alexander Skene, *hymen cribriformis*, hymen with a number of small openings; *hymen annularis*, hymen with one small central opening; *hymen fimbriatus*, fringed like the Fallopian tube. To those three I would add the variety I then described as *folding hymen*.

Kinkead,* of Queen's College, Galway, has instanced cases in which frequent coition had taken place, and others in which labour at full term was completed, without injury to the hymen. Lombe Atthill has alluded to this yielding of the rubber-like hymen during intercourse, without the least cracking. In some most serious cases that have been brought to me for an opinion as to the alleged impotence of a husband or the chastity of a woman, and in which the gravest issues were involved, I found this '*folding*' form of hymen. The hymen was quite perfect and uninjured, yet a fair-sized speculum, or a vaginal dilator, could be passed into the vagina. The membrane simply folded back against the vaginal wall, returning again to its normal position on the withdrawal of the instrument. It must be remembered that the carunculæ are formed by child-bearing only, and not by simple laceration. The importance of remembering that this yielding form of hymen may exist is obvious. It may have a critical bearing on the medical evidence in a case of supposed rape.

Medico-legal Bearings.

The following examples show the need for recognition of this condition of hymen :—

I.—A patient was brought for examination who had been recently married. A coolness had arisen immediately after marriage, owing to some difficulty having occurred in intercourse, which she ascribed to ineffectual efforts on the part of her husband. But, contra, he alleged that she had resisted, and feigned such great pain at the time that he had to desist. The coolness was accentuated by a suspicion of previous impurity on the part of the woman. Upon examination, the hymen was found complete, but of the folding type. An opinion had previously been given that the woman was intact. Subsequent disclosures proved that she had lived irregularly, and had aborted previous to her marriage.

II.—A patient wished to establish a charge of impotence against her husband.

* Paper read before the Royal Academy of Medicine in Ireland on the 'Proofs of Virginity,' by R. Kinkead, December 29, 1887.

She had already been examined with this object, and pronounced intact. It was ascertained that there had been only a few occasions on which sexual intercourse could have occurred within a given number of months. She strongly resisted internal examination, lest the hymeneal proof of her virginity should be destroyed. Looking at the hymen, it was found to be uninjured and normal in appearance. Casually, during examination, a slight suprapubic enlargement was discovered. This aroused suspicion, which the appearance of the mammæ confirmed. A vaginal examination was carefully made, and a perfectly yielding hymen was found of the nature described. Though told that she was pregnant, the patient persisted in the denial of cohabitation having taken place, even to the point of endeavouring to produce medical evidence of her chastity in a case for nullity of marriage. She was, however, confined of a child at full time some six months subsequently.

III.—A most serious charge was preferred against a man, which he in part rebutted by exculpatory evidence on oath that he had had intercourse with a young girl, extending over a considerable period of time. The case was one in which the gravest issues were at stake.

The girl's cause was subsequently taken up by powerful friends, and she was submitted to medical examination. The hymen was found complete, and upon this fact medical opinions were elicited that it would have been impossible, or at least improbable, that sexual intercourse could have been continued over such a length of time as that stated. She was brought for an expert judgment on this point.

The hymen was found as already described, but on a digital examination being made, it completely yielded and folded back.

Ultimately, without any force or difficulty, a fair-sized conical speculum was passed, and also a comparatively large glass vaginal dilator, without the least injury. The opinion was given that frequent coition, partial or complete, was quite feasible under the conditions, but that *the chastity of the girl was not impugned*.

Nevertheless legal pressure, only stopping at the point of dragging an unwilling and hostile medical witness into court, was unsuccessfully exercised to force an opinion that it was not possible under these conditions that repeated copulation could have happened.

These three examples are sufficient for my purpose. In them we have the following issues involved :—

In Case 1.—The impotence of the husband, and the ante-marital chastity of the wife, as bearing on the question of nullity of marriage or separation.

In Case 2.—The impotence of the husband, and the problematical doubt raised as to the parentage of the child.

In Case 3.—The perjury of the man and the chastity of the woman.

A case came under my notice in which a prolongation of the perinæum in the shape of a fold of skin covering two-thirds of the introitus gave rise to a plea for nullity of marriage. Intercourse had, however, frequently occurred.

Perineum.—Sufficient has already been said of this body as a support, to indicate the necessity of attending to any old lacerations

or rents. Defect of the perineal body is one of the most frequent associated causes of uterine displacement. We also learn this important lesson, always to inspect the perineum after labour, especially after a first labour. Many a small rent, the source of future uterine trouble, escapes notice even after ordinary labour. Let us always regard Goodell's two invaluable hints—'relaxation of the perineum' and 'immediate suture.' To 'relax the perineum' in labour, we pass the fore and middle fingers of the left hand into the rectum, and hook forward the sphincter, while the thumb of the same hand retards and modifies the pressure of the advancing head. The harmful old practice of 'supporting' it and the negligence of postponing the closure of the rent, have cost many a woman an infinity of misery, and, through a septicæmia, induced by perineal wounds made in operating and during the puerperal period, have occasionally caused peritonitis and death.

The Pouch of Douglas.—This important space, formed by the utero-rectal folds of peritoneum, is the receptacle occasionally of an intestinal loop, a prolapsed ovary, cystic tumours, ovarian tumours, effusions of lymph, pus, and blood. Encroaching on it we may find a retroverted uterus, and pressing upwards into it, in extreme cases of ante flexion, the cervix uteri. Obstructing it posteriorly, we meet with faecal accumulation, malignant growths of the rectum, and sacral tumours. In ordinary conditions the rectal and uterine walls of Douglas' space are in apposition; they are separated by tumours, effusions, and anteverted and ante flexed states of the uterus.

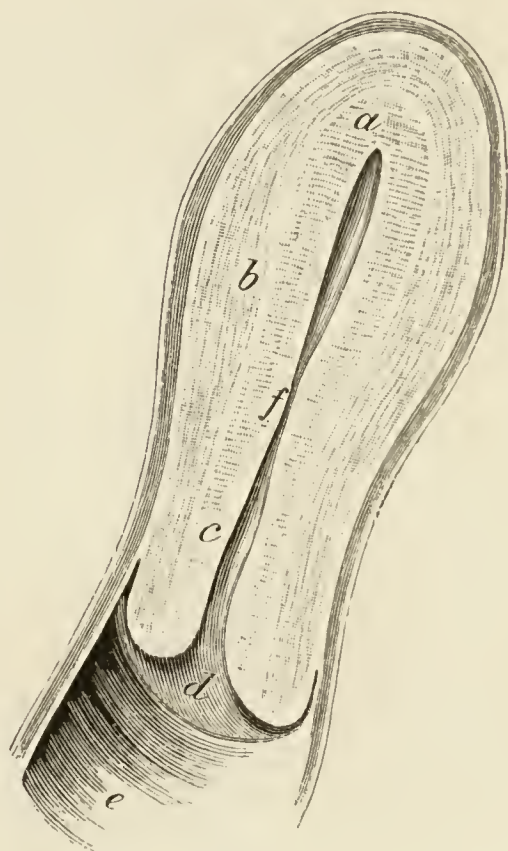


FIG. 8.—VERTICAL SECTION OF UTERUS (RAMSBOTHAM).

Examination of the Pouch of Douglas.

To examine this space properly, an enema should first be administered, and the rectum *gently* but thoroughly explored with the finger.*

* Elsewhere the anatomical peculiarities of the rectum in children and the clinical bearing of these are discussed. See chapter on 'Steps of Examination.'

It is better first to partly introduce the forefinger of the left hand, well anointed with lard, slowly stretching the external sphincter to either side, and then gradually insert the entire finger and explore the rectum; we may detect internal hæmorrhoids, polypus, fissure, ulcer, or stricture; a collection of fluid in Douglas' pouch, uterine retroversion, adhesions, or prolapse of an ovary. In retro-hæmatocele, and pelvic effusions, such an exploration is essential to define their nature—if hard and resisting, or soft and yielding. Thus we may often best ascertain the sensitiveness, or degree of congestion, of the ovary.

The therapeutical dilatation of the rectum under an anæsthetic for an excessive reflex irritability of the sphincter, with dryness of the mucous membrane, brought on occasionally by erotic practices, is dealt with in the chapter on the Rectum.

The Uterus.—It is right that we should always have before our mind what are the dimensions, size, and weight of the healthy uterus in the young virgin, and in the adult and multiparous woman :—

From Richet and Sappey.	Measurement in inches.		
	Virgin.	Nulliparæ.	Multiparæ.
Entire Uterus, longitudinal . . .	2·20	2·52	2·72
" thickness . . .	0·85	0·90	1·00
" transverse . . .	1·22	1·80	1·90
Cavity of Uterus, transverse . . .	0·60	1·08	1·24
" length . . .	1·80	2·20	2·44
Isthmus uteri, length . . .	0·20-0·25		0·16
" width . . .	0·16		
" antero-posterior . . .	0·12		
	Grains.		Grains.
Weight	360 to 1000		1200 to 1800
Capacity		2·2 c. cm.	3·5 c. cm.

The uterus in the perfectly normal condition should not be felt above the pubes. It is felt over the pubes about the third month of pregnancy, and two fingers' breadth above it at the fourth. In the natural state it lies anteverted in the pelvis. It is included between two lines, one drawn from the sacrovertebral angle to the lower border of the pubic bone, and the other carried from the inferior margin of the fourth piece of the sacrum to the lower border of the symphysis. The axis of the uterus obviously varies with the condition of either the bladder or rectum. This is well seen if we note the position of the uterus as represented by Kohlrausch, and

compare it with the diagrammatic drawing of Schultze. In the former the bladder is distended, while the latter represents the normal position of the virgin uterus. It is important to remember

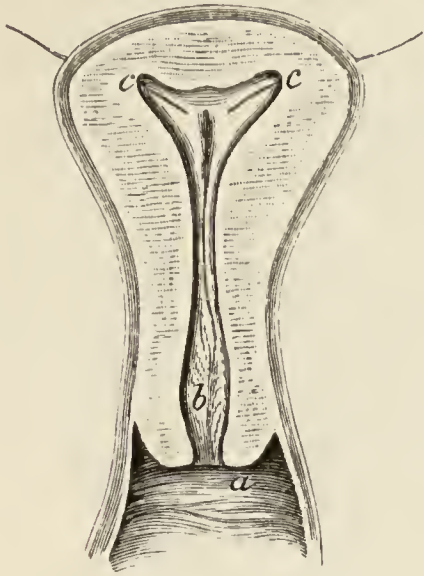


FIG. 9.—LATERAL SECTION OF UTERUS. (RAMSBOTHAM.)

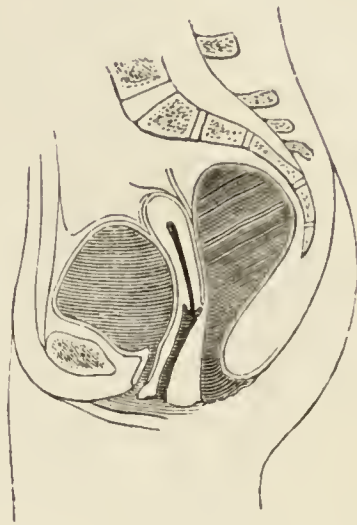


FIG. 10.—FROM BRAUNE, SHOWING UTERUS PRESSED UPON BY DISTENDED BLADDER AND RECTUM. (LEGENBRE.)

how freely movable the healthy uterus is, *slung*, as we may say, in the pelvis, by its various ligaments. This mobility is influenced by the



FIG. 11.—NORMAL POSITION OF VIRGIN UTERUS. (SCHULTZE.)

size of the uterus, by the condition of the surrounding cellular tissue, and the state of the pelvic ligaments—*fixation of the uterus* being a most important guide in the diagnosis and prognosis of

various uterine affections. It is frequently fixed in fibroid enlargement, in malignant disease, by pelvic peritoneal effusions, and in cases of retroversion where adhesions exist. We are enabled, from its normal dimensions, to estimate comparatively its increase in size in morbid states, notably in fibroid enlargement and subinvolution. The dimensions of the isthmus explain to us the difficulty occasionally met with in passing the uterine sound, and how essential free dilatation of the sphincter uteri is in any form of intra-uterine medication. They also explain how readily the narrow canal may be closed by reflex contraction, by irritation or inflammation, and how thus secretions or medicated solutions are imprisoned in the uterine cavity. Just as important is the situation of the isthmus

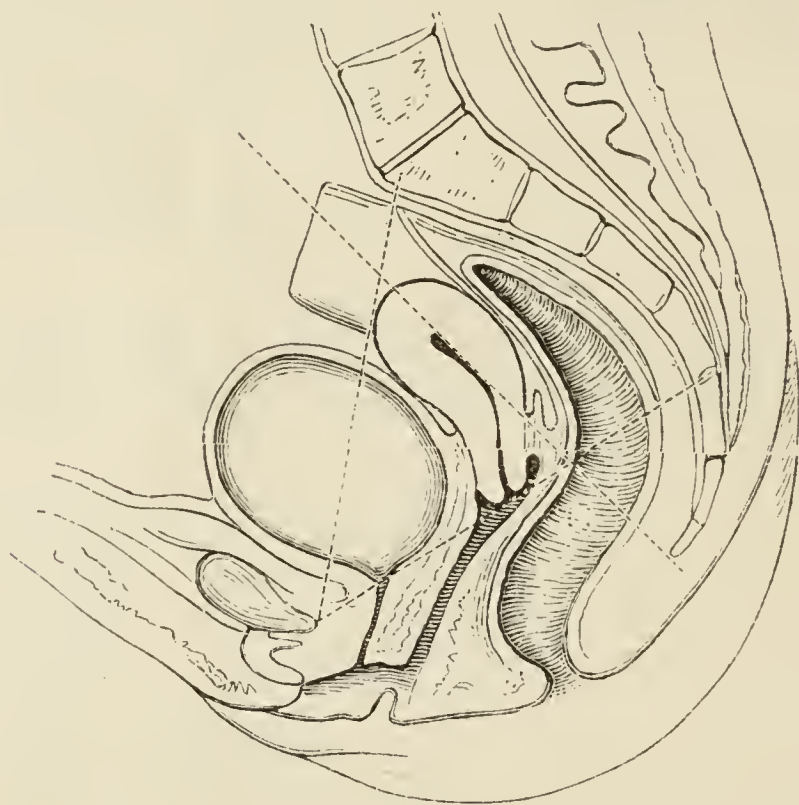


FIG. 12.—RELATIVE POSITION OF PELVIC VISCERA WHEN THE UTERUS IS PUSHED BACK BY A DISTENDED BLADDER. (A. FARRE.)

uteri with regard to the reflected utero-rectal and utero-vesical folds of the peritoneum. Above and below the isthmus uteri the organ is free, being supported just at this part by the bed of cellular tissue which surrounds it. The uterus is thus balanced in the pelvis by the reflections of peritoneum and encircling cellular tissue. The uterus has the tendency to bend backwards and forwards at this situation—a bending still further increased by the consequent constriction of the bloodvessels, at the junction of the cervix with the body, and an increase of weight, posteriorly or anteriorly, from congestion of the tissues or small myomata, in the posterior or anterior wall of the fundus above the seat of constriction. Constriction

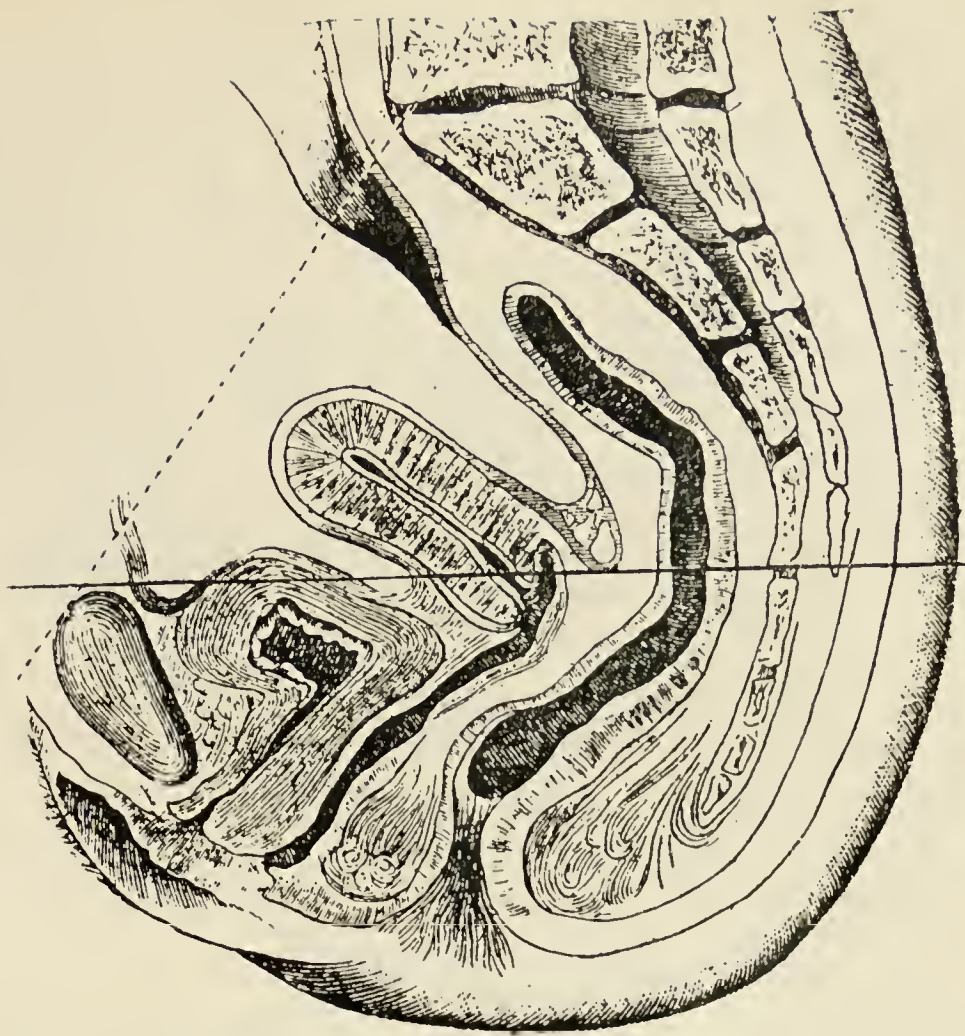


FIG. 13.*—POSITION OF THE PELVIC ORGANS IN THE ERECT POSITION
(HEGAR.)

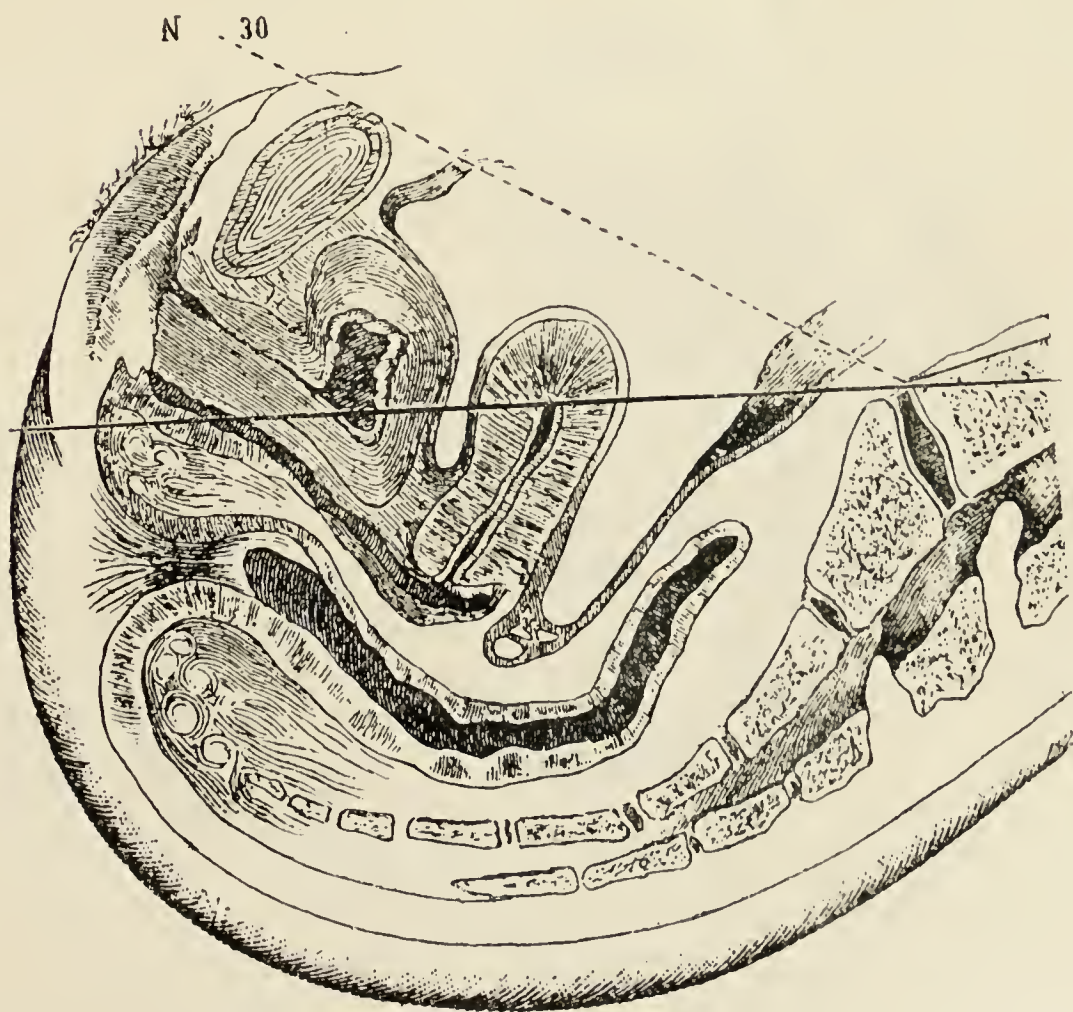


FIG. 13a.—POSITION OF THE PELVIC ORGANS IN THE DORSAL POSITION.
(HEGAR.)

* These figures are from Professor Mangiagalli's treatise on 'Diseases of Women,' vol. i. [To face p. 16.]

N 20

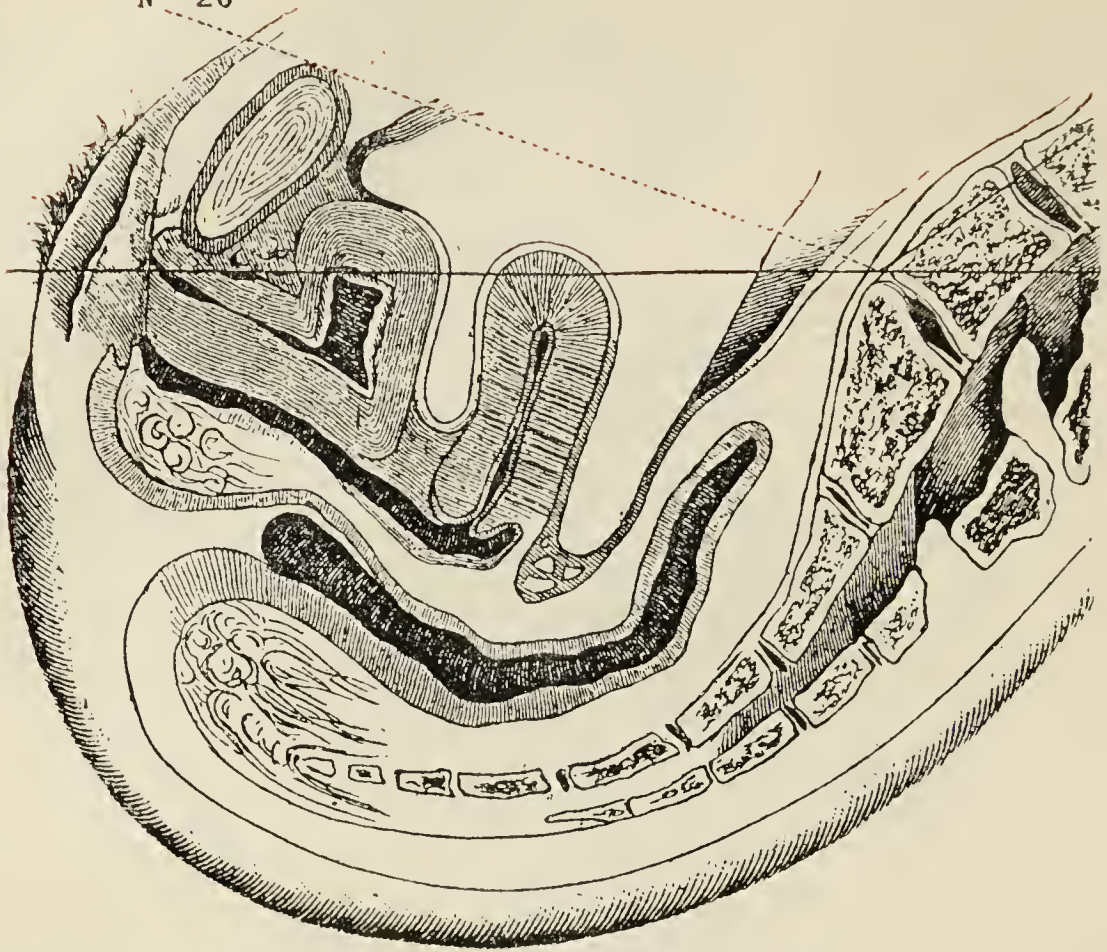


FIG. 13*b*.—POSITION OF THE PELVIC ORGANS IN THE DORSO-SACRAL POSITION.
(HEGAR.)

N 60

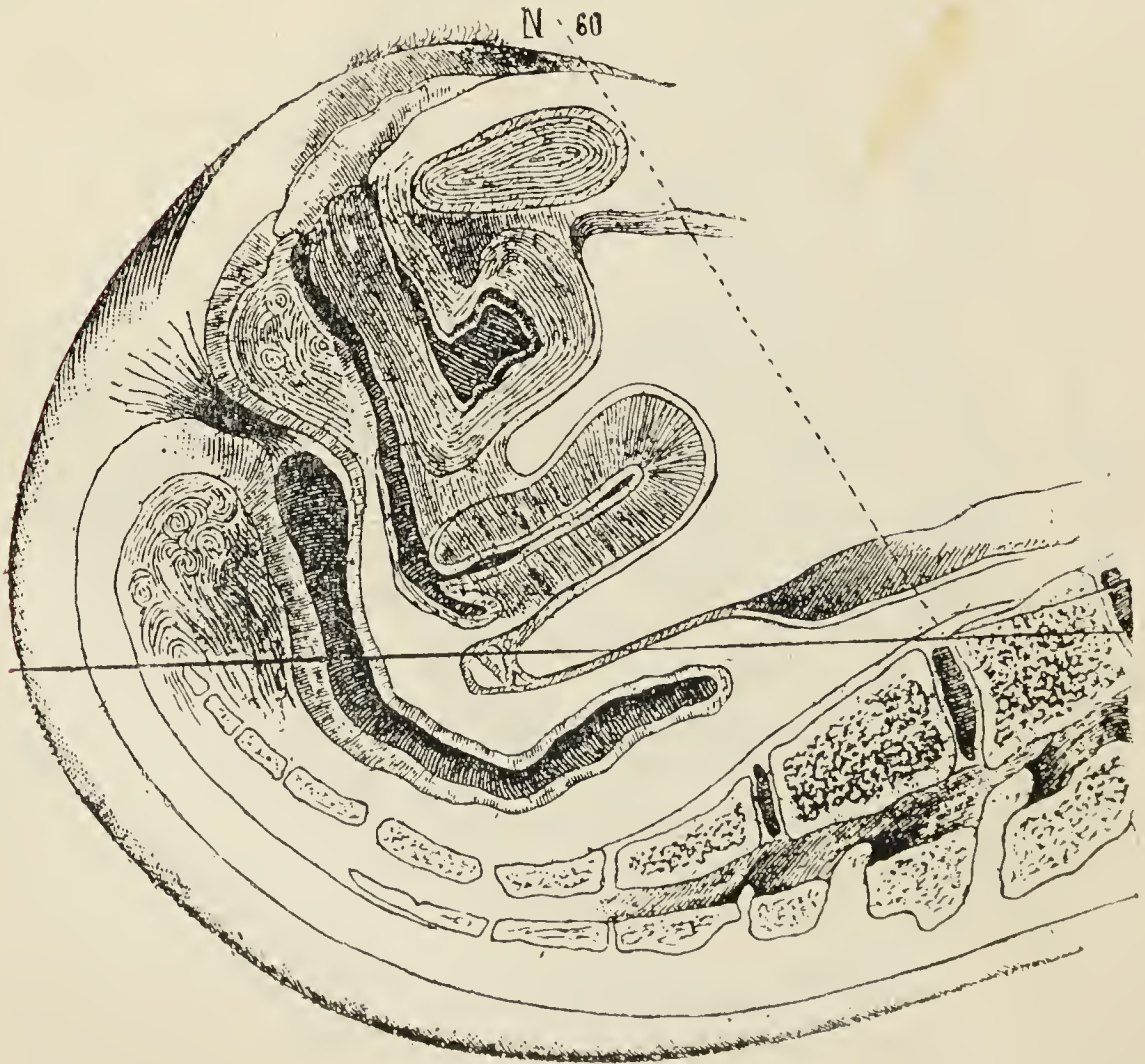


FIG. 13*c*.—POSITION OF THE PELVIC ORGANS IN THE DORSO-LUMBAR POSITION.
(HEGAR.)

leads to congestion, congestion to hyperplastic effusion, and both to tissue-formation, tending ultimately to contraction, and resulting flexion. Flexion produces narrowing or twisting of the uterine canal at this spot, and stenosis, with all its consecutive ills.

Such a sequence of changes produces congestion of the fundus uteri, stenosis of the cervix, hyperplastic effusion, versions, flexions, fibroid developments, hardness of the cervix, amenorrhœa, dysmenorrhœa, and sterility. This freedom of movement teaches us also the importance of *not overlooking the uterus as a source of vesical irritation, retention, or incontinence of urine.*

Cure of Chronic Incontinence of Urine by Rectification of Displacement.

A patient for twelve years had had incontinence of urine, until, ultimately, she was shut out from the enjoyment of society, and had always to wear a diaper or urinal. Her life was miserable, from the constant passing and dribbling of the urine. She had been under a variety of treatment. The ante-flexed uterus was gradually straightened by the use of the sound and stem pessaries. The bowel was carefully attended to, and the general health restored by suitable tonics. She recovered perfect health and comfort, nor was there at any time the least tendency to unusual irritation of the bladder. *Such a case would now be one for treatment by ventro-suspension or fixation.*

Cure of Incontinence of Urine by Ventro-fixation.*

A lady, aged forty-eight, suffered from incontinence of urine, she having for some time been obliged to wear a urinal. During my examination the urine was flowing from the bladder. There was a large ante-flexed uterus, the fundus of which lay directly forward on the neck of the bladder. There was also anterior vaginal prolapse. Three days after the operation of ventro-fixation was performed she passed her urine naturally, and there was five hours' interval between the emptying of the bladder. From that time to the present she has passed water naturally, and can retain it without distress for seven hours. [I quote this case as it was the first I treated by this operation. Since then I have completely relieved several equally obstinate cases of incontinence by ventro-suspension.]

Histological Bearings on Clinical Conditions.—In studying interstitial changes in the uterine wall, and the invasion of the endometrium and submucosa with inflammatory products, as well as the extension of inflammation to the peritoneum, it is important to keep in mind—

1. The thickness of the muscular coat of the uterus. This is

* *Transactions Obstetrical Society*, vol. lx., 1899, p. 227.

hard to define, in consequence of the intermixture of areolar tissue between it and the mucous lining on the inside, and the peritoneal tunic externally. It probably does not exceed 6 mm.*

2. The thickness of the mucous membrane and the large inter-spersion of muscular fibres throughout it.

3. The concentric arrangement of the fibres at the orifices of the Fallopian tubes, and the transverse sphincter fibres at the external and internal os.

4. The greater firmness of the cervical mucous membrane as well as its hardness, as compared with that of the body, and the stratified character of the epithelium of the lower portion of the cervical canal, and the presence of numerous vascular papillæ.

Uterine fibroids, collections of fluid or old effusions in Douglas' space, relaxation of the utero-sacral supports, will also throw the uterus forwards, and press it against the bladder. How obviously prudent, then, is the general rule *in all cases of vesical trouble in women, where no other explanation is otherwise afforded, to make a vaginal examination and ascertain the condition of the uterus!*

The ready manner in which slight swelling of the mucous lining of the narrow canal of the isthmus uteri may cause its closure and imprison secretions, forces on us the importance of the safe rule, *always to dilate the canal of the cervix before internal medication of the cavity of the fundus*, and to maintain that dilatation when there is any suspicious flow, especially of a hæmorrhagic character, from the interior of the uterine cavity.

This same fact shows how futile are those abortive attempts to treat mechanical dysmenorrhœa associated with sterility, or ordinary congestive dysmenorrhœa consequent upon stenosis of the os uteri, by any of those playful slitting operations of the cervix that do not reach the real cause of the obstruction, disappointing alike the patient and practitioner. The stress laid on the essential axiom, thoroughly to divide the canal of the cervix uteri and to maintain its dilatation, in cases of stenosis, was one of the features in the impressive teaching of the late Marion Sims.

The Uterine Ligaments and the Pelvic Fascia.—While the mechanical purposes secured by these ligaments—more especially the utero-sacral, broad, and round ligaments—in supporting the uterus and maintaining it in position are not forgotten, there are some other matters connected with their attachments and relations

* Quain's 'Anat.,' 10th ed., vol. iii. part iv.

that must not be overlooked. The uterus is mainly retained in position by the recto-uterine and utero-sacral folds of peritoneum.

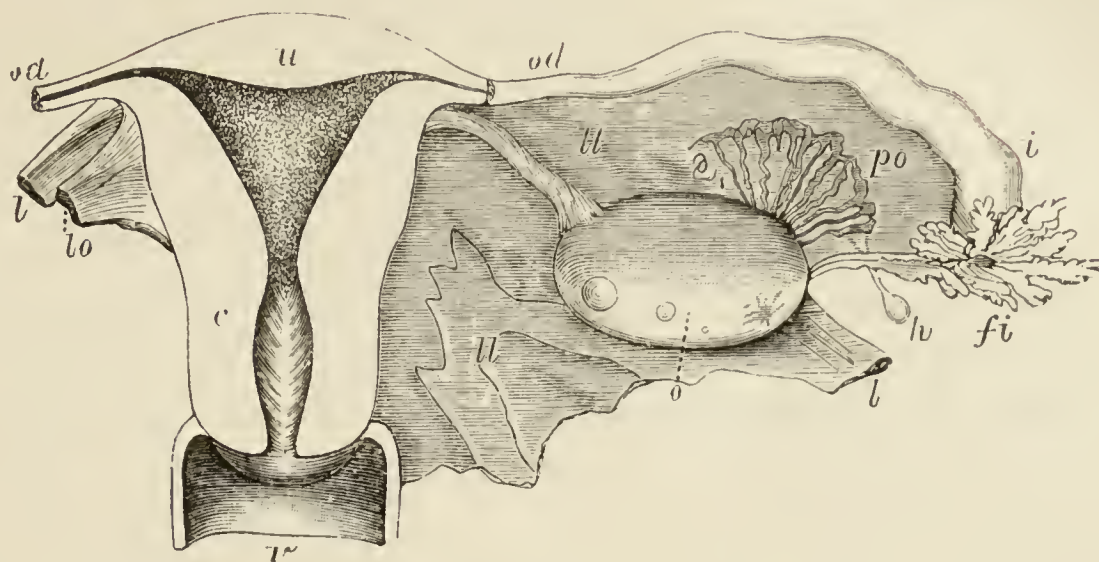


FIG. 14.—UTERUS AND APPENDAGES. DIAGRAMMATIC VIEW ('QUAIN'S ANATOMY').

In the dragging on and stretching of these we have doubtless a ready explanation of the characteristic sacral pain so frequently

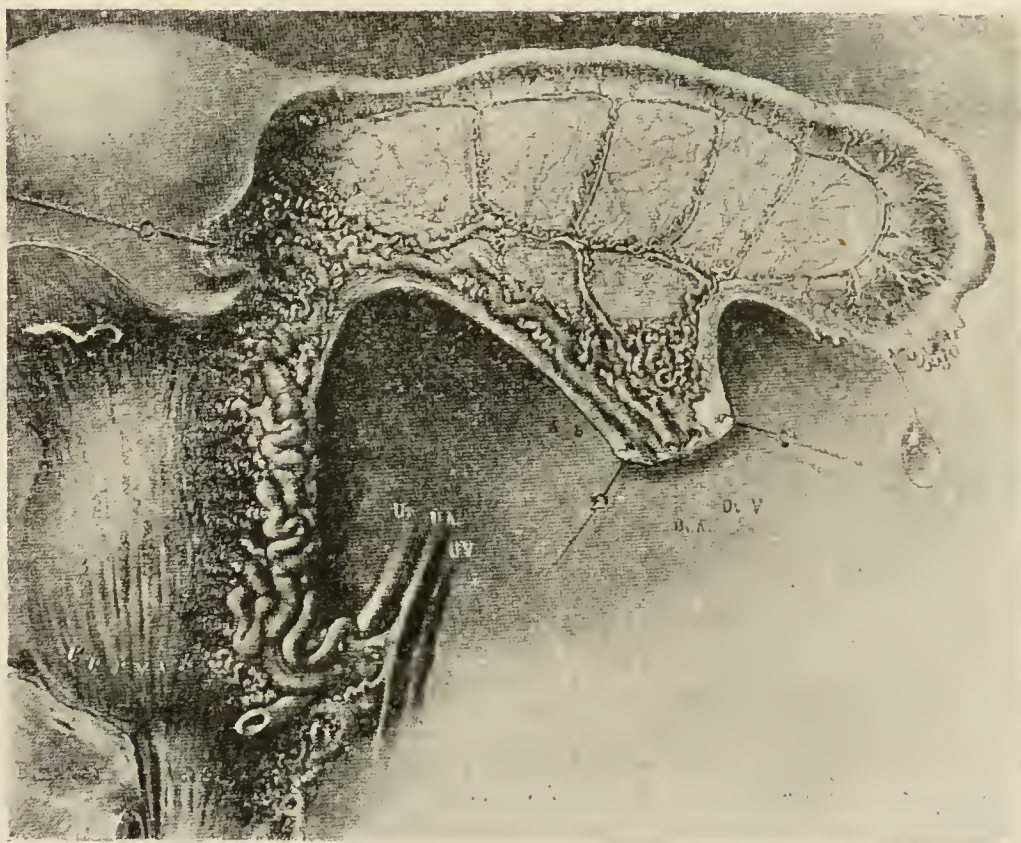


FIG. 15.—VASCULAR RELATIONS OF UTERUS, OVARY, AND FALLOPIAN TUBE, SEEN FROM THE FRONT. (FROM HOWARD KELLY.)

Ur., ureter; U.A., uterine artery; U.V., uterine vein; O.A., ovarian artery; O.V., ovarian vein.

complained of. As we shall see in treating of backward displacements, they are the most important of all the pelvic ligaments in the ætiology of retroflexion. These *recto-uterine folds* contain

between their layers both fibrous and smooth muscular tissue, and it is of importance to remember that some of these muscular fibres reaching backwards to the rectum constitute the recto-uterine muscle, while others, attached to the front of the septum, form the utero-sacral ligament. In some cases 'the recto-uterine folds are continuous with one another across the middle line behind the cervix uteri.'* The vascular and sensitive round ligaments contribute their share to the support of the uterus, and may serve to favour conception (Rainey), through the muscular power with which they are endowed, in altering the direction of the uterus. When they are put on the stretch and dragged on, as in displacements and in procidentia, we have a satisfactory clue to the pain complained of as running in the course of these ligaments, so frequently accompanying congested states both of the uterus and ovaries. (The reader will find these points more fully referred to in the chapter on 'Retroversion of the Uterus.')

Cunningham, in describing the recto-uterine folds, says: 'Each contains between its layers a considerable amount of smooth muscular tissue. Some of these fibres, which are continuous with the uterine wall, pass backwards to reach the rectum, and constitute the recto-uterine muscle; others, gaining an attachment to the front of the sacrum, form the utero-sacral ligament.'

Structure of the Round Ligaments—Bearing on Hernia and Growths.

The anatomical points of gynaecological interest in connection with the round ligaments are the permanency of the plica gubernatrix from the Wolffian body (the analogue of the gubernaculum in the male), constituting the round ligament of the ovary in the female, its attachment to the uterus arresting the descent of the ovary, except in rare cases when, passing by the canal of Nuck, the ovary may reach the labium; the peritoneal accompaniment of the round ligament, which corresponds to the processus vaginalis in the male, and which, when not obstructed, forms in its prolongation the patent canal of Nuck; thirdly, the presence of areolar tissue and vessels in and around the round ligament, and the prolongation of the transversalis fascia from the internal abdominal ring. Now, by these anatomical data we can explain the presence of intestinal hernia, epiplocele, hydrocele, incarcerated ovary, and a cyst or fibroma in the canal and labium. The diagnosis is not always easy. Pozzi, in speaking of the fluid contained in cysts in the canal, says that the persistence of the canal of Nuck is looked upon by most authorities as explaining the presence of such cysts, though this is denied by Duplay; and Schroeder has reported a case in which he was able to return the fluid into the abdomen, thus demonstrating a communication of the cyst

* D. J. Cunningham, F.R.S., 'Text-book of Anatomy,' 1902.

with the peritoneal cavity, and establishing a resemblance to congenital hernia in the male. This exactly occurred in one of my own cases. Sometimes the cyst may be seated in the *interior* of the round ligament. This may be due to a persistence of the female gubernaculum in its foetal form (Weber).

Pelvic Fascia.—Remembering the disposition of the pelvic fascia, we can understand the association between over-distended conditions of the bladder and uterine discomfort, from the connection of the bladder and uterus through the utero-vesical ligaments, while the general distribution of the uterine and pelvic peritoneum, and the intimate association between it and the extensive fascia of the pelvis, offer a ready explanation of the rapid transitional phases of uterine and pelvic inflammation—metritis passing into perimetritis, and general peritonitis as a sequence to both. From the broad ligaments above to the sciatic notches below, we have the complete continuity of the cellular tissue maintained. A match struck at one end of the train quickly lights the mischief that with lightning rapidity often spreads until the entire pelvic viscera are involved, the force of the conflagration being still further heightened by the adjacent peritoneum taking on inflammation, and a localized or general peritonitis ensuing.

Infra-Vaginal Portion of Uterus and Os Uteri.—The infra-vaginal portion of the uterus, or that projecting into the vaginal passage, has, at the apex of the rounded cone, the opening leading to the canal of the uterus. The importance of the division of the cervix uteri into a supra-vaginal, infra-vaginal, and intermediate portion, is obvious when we consider the pathology of prolapse or hypertrophic elongation. The infra-vaginal portion varies in length, but it may be taken at from half to three-quarters of an inch. By the length and shape of this vaginal portion, and the character of the os uteri, we can form a fair opinion of the condition of the uterus. Its shape and size may be altered; either it is shortened, or, on the other hand, hypertrophied and elongated. Instead of the characteristic sensation of yielding a little to the finger, it may be either very soft, or, on the contrary, hard and resisting. Take as an example of the former condition the uterus of pregnancy, and of the latter the hardened cervix in fibroma, or the characteristic hardness of schirrus. It may be nipple-shaped, as in many cases of fibroid, and the infra-vaginal portion appear to the examining finger to move over the body of the uterus, like the nipple of the breast over a hard mammary tumour. The conical form may be lost, and we search for the small ‘pinhole’ orifice of the os uteri, and detect it at times with difficulty. Or the short cervix runs

sharply to a pointed cone, in the very apex of which is the orifice of the os externum.

The Os and Cervix Uteri.

To digital touch the os uteri varies in shape, size, and character, from the typical os uteri with its anterior and posterior lips

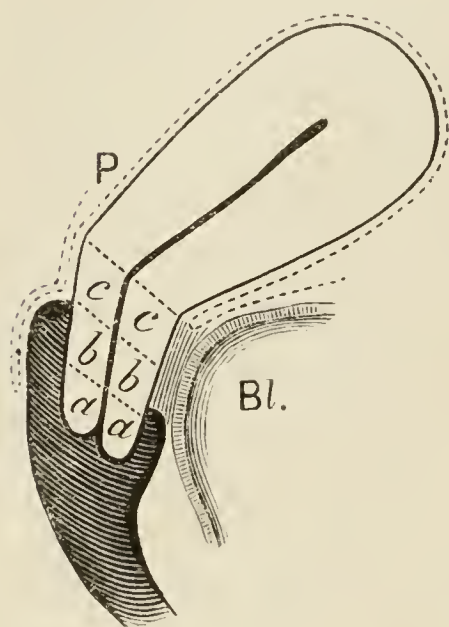


FIG. 16. — DIAGRAM OF UTERUS TO SHOW DIVISION OF CERVIX. (SCHROEDER.)

a, infra-vaginal; *b*, intermediate; *c*, supra-vaginal; dotted line shows peritoneum.

running transversely—giving to the finger (Cruveilhier) a sensation like the feeling of the cartilage at the end of the nose—to the mere slit, slight fissure, or small circular aperture, and occasional absence of the orifice with atresia of the uterine canal. With this congenitally small opening and cervix we often find associated dysmenorrhœa, ovarian pain, and sterility. In multipara the os may be large and dilatable, admitting the point of the finger; or fissured and lacerated as a consequence of labour or instrumental delivery. In pregnancy it partakes of the characteristic general softening of the cervix, and hence it has more of a velvet-like feeling, and is soft and patulous. It is frequently filled with tenacious mucus, which is so difficult to remove, and in varying degrees of ropiness, hangs from it, a frequent cause of sterility.



b

FIG. 17.—CONGENITAL STENOSIS.

Pin-hole, os uteri (*a*); common form of conical cervix (*b*).

Uterine and Vaginal Secretions.—There are some general considerations that bear on our knowledge of normal uterine and vaginal secretions and discharges. It is well to remember the close and intimate connection, permeability, and porous nature of the uterine tissues. This is of importance, and explains those metritic troubles which have arisen after intra-uterine medication, independently of the passage of any fluid into the Fallopian tube. The

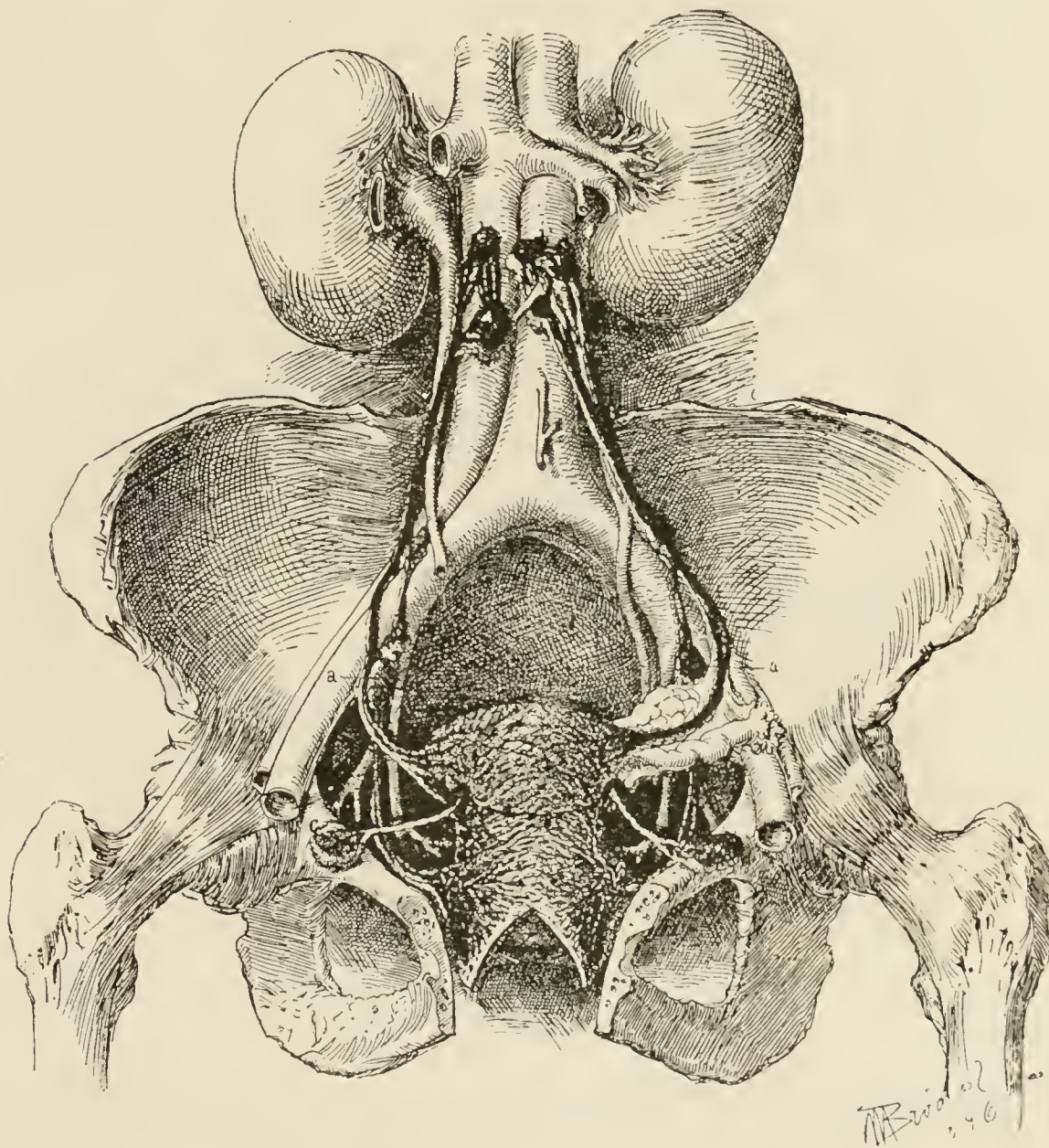


FIG. 18.—LYMPHATICS OF THE PELVIC ORGANS. (HOWARD KELLY.)

Showing the lymphatics accompanying the arteries and the anastomoses with the lumbar glands; the dense ramifications on the uterine wall and their anastomoses with the above or traced downwards to the inguinal glands. The tributaries of communication of the lymphatics of the external genitals and lower part of the vagina likewise reach the inguinal glands.

size of the uterine veins throws light on the frequent occurrence of thrombosis and septicæmia.

The large number of lymphatics distributed throughout its tissues, and their free communication with the lumbar and pelvic ganglia, render this organ peculiarly prone to septic absorption.

Now that the operation of curettage is so frequently performed, this anatomical fact should be kept in mind. 'Scraping' of the womb, an unfortunate term that has now passed into popular use, is so commonly resorted to that the need for special care in previous dilatation and strict antiseptic precautions is apt to be overlooked. Elsewhere in dealing with the operation of curettage this caution is emphasized. The normal mucous plug that fills the cervix uteri helps to ward off septic change by preventing the admission of air into the uterine cavity. It comes from the cervical glands, is alkaline, is washed away by the menstrual flow, and does not interfere with the passage of the spermatozoa. Elsewhere (see chapter on 'Sterility') the effect of the vaginal and

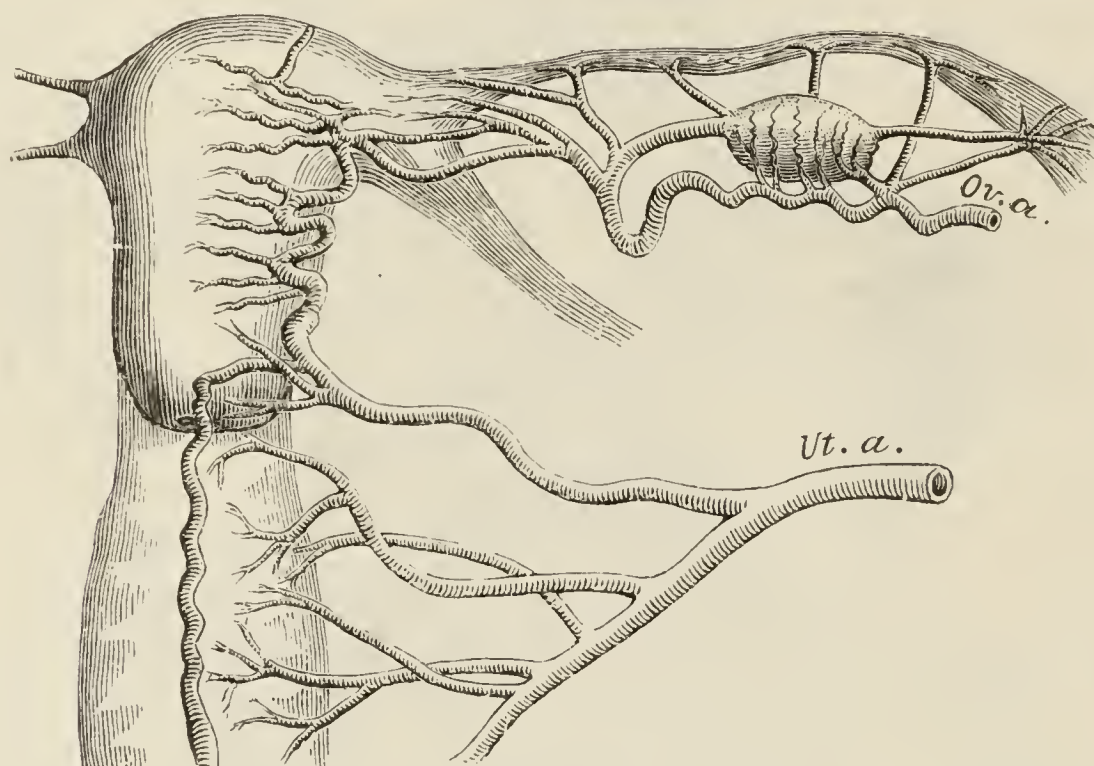


FIG. 19.—DIAGRAM OF THE VASCULAR SUPPLY OF THE VAGINA, UTERUS AND OVARY. (MODIFIED FROM HYRTL.)

cervical secretions on the spermatozoa in causing sterility is referred to. The epithelium found in the discharge is dentated.

The mucous membrane of the cavity of the uterus and of the Fallopian tubes secretes, on the contrary, a whitish alkaline mucus, not so tenacious, with columnar ciliated epithelium contained in it. This secretion is often profuse, and, on examination with the speculum, we see it poured out in quantity from the uterus.

Very different is the secretion commonly found at the fundus of the vagina, and the neighbouring cervix uteri. It comes from the outer surface of the cervix and adjoining vaginal wall. The epithelium is squamous, the reaction is acid. The remainder of the vaginal mucous membrane secretes an acid (squamous) mucus and the

sebaceous glands of the vulva pour out an oily secretion. The Fallopian tube or oviduct is contained in the free edge of the broad ligament, which 'forms a kind of curtain over the gland, while the latter comes to lie in the "bursa ovaria," or pocket, formed by the ligament' (Cunningham); thus floating free in the pelvis, they enter the uterine wall at their inner ends. Traced from the uterus, they pass almost horizontally onwards for a distance of from half an inch to an inch, until they reach the side wall of the pelvis, after which they ascend, frequently in a tortuous manner, in front of their corresponding ovaries, and then arch backwards from these glands, and, internally, to their suspensory ligaments. Turning downwards, the fimbriæ are opposite the inner surfaces and posterior borders of the ovaries' (Quain).

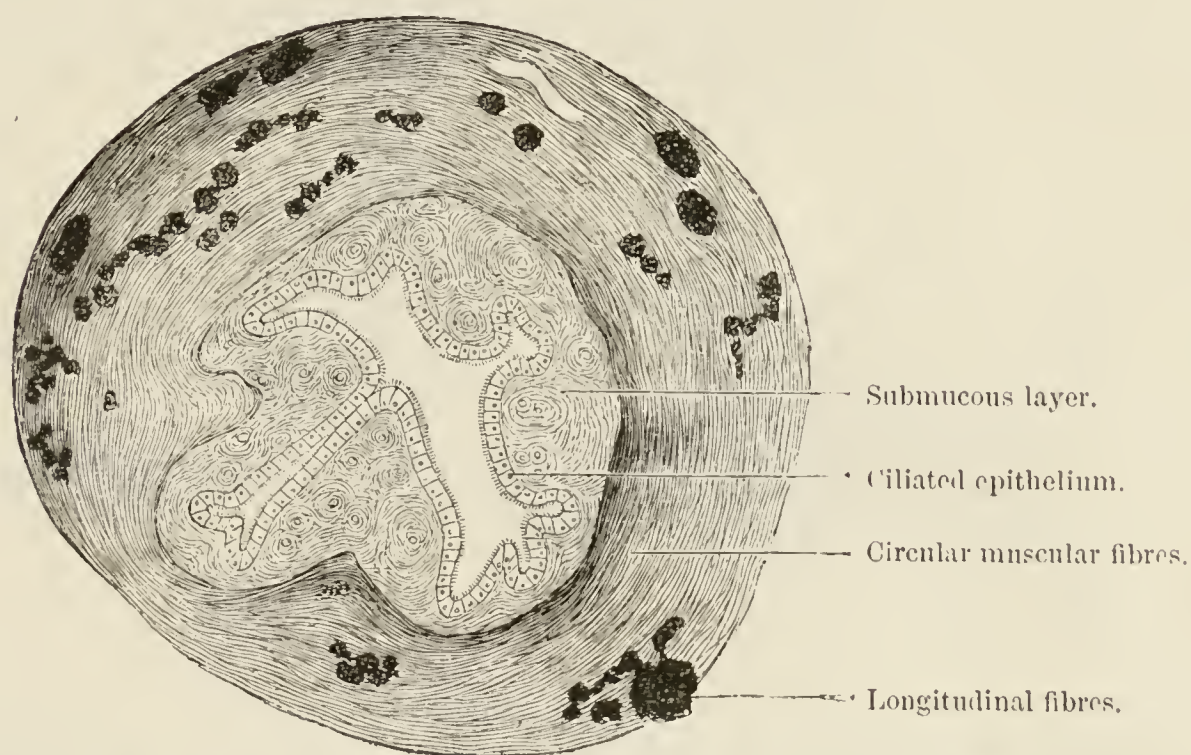


FIG. 20.—NORMAL FALLOPIAN TUBE IN SECTION. ($\times 10$ DIAMETERS.) (MACALISTER.)*

The Fallopian tubes are liable to twists and bends, and to contract adhesions to adjacent parts, while their connection with the ovaries and uterus render them liable to every influence which any change in the position of these latter organs exerts.

The different portions of the Fallopian tube, the isthmus, ampulla, neck, and fimbriated end, all have their clinical and pathological interest for the surgeon. These various points will come into prominence in the discussion of morbid states of the tube and the arrest of the ovum in any part of it in ectopic gestation.

Owing to the small calibre of the uterine portion of the tube (0.12 of an inch in diameter), and the fact that its orifice is filled

* See chapters on diseases of the Fallopian tubes for sections of diseased tubes; also chapters on Tuberculosis of the Genitalia and Ectopic Gestation.

with mucus, it follows that fluid is, as a rule, prevented from passing from the uterine cavity into the Fallopian tube. If this plug be disturbed, or the tube be more patent than usual, fluid may then readily find its way into the peritoneal cavity.

Tyler Smith, recognizing the patent condition of the uterine orifice, suggested catheterization of the tubes in cases of obstruction, tubal gestation, etc. Matthews Duncan drew attention to this abnormal patency, and pointed out that it afforded an explanation of the passage of the sound out of the uterus in certain cases. This I satisfied myself of in a woman sent for operation for ovarian tumour. On several occasions the sound passed readily its entire length, though the uterus was not enlarged, as was proved on operation. The explanation lay in the passage of the instrument into the peritoneal cavity through the patent tubal orifice.

Repeated attacks of salpingitis or recurrent pelvic peritonitis with consequent adhesions, influence the size, position, and patency of

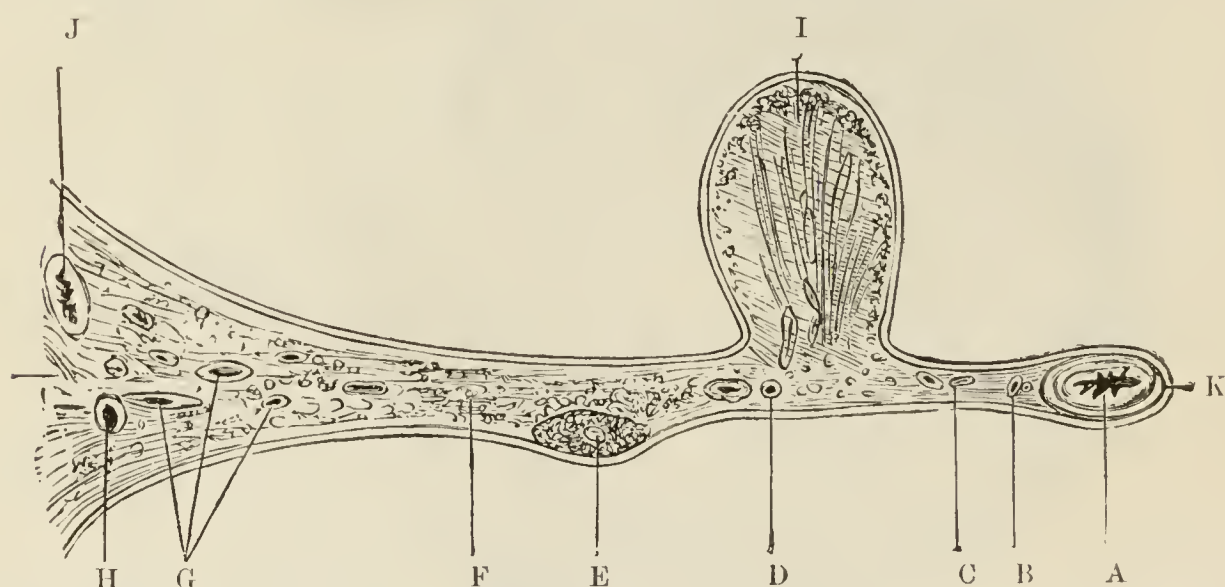


FIG. 21.—VERTICAL SECTION THROUGH THE BROAD LIGAMENT. (ANDERSON.)

A, Fallopian tube; B, tubal branch of ovarian vessels; C, parovarium; D, ovarian artery; E, round ligament and funicular vessels; F, connective tissue and unstriped muscle (utero-pelvic band); G, uterine veins; H, uterine artery; I, ovary; J, ureter; K, reflected peritoneum.

the tubes and their power of grasping the ovary. We frequently find, in cases of sterility, thickened states of the broad ligaments, adherent ovaries, contractions and adhesions in the vaginal roof. The menstrual secretion may thus be retained in the Fallopian tube. This retention and various other causes lead to its dilatation, while fluid accumulation and cysts are occasionally the cause of its distension, as occurs in hydro-salpinx, hæmato-salpinx, and pyo-salpinx. The causes and consequences of tubal pregnancy are discussed in the chapter dealing with this complication. The occurrence of salpingitis, as a consequence of inflammation of the cavity of the uterus, and especially as a sequence of gonorrhœal infection, is also readily understood.

The Ovary.*—The ovary at either side of the pelvis is in its normal state about the size of a large almond, weighing from 80 to 100 grains. The position of this gland, whether its long axis be vertical or situated obliquely and parallel with the iliac vessels, is differently described by His and Kölliker. Cunningham gives the vertical as most usual position (*loc. cit.*). In old age the gland atrophies and becomes fibrous. Its exact position is determined by the surrounding viscera and the position of the uterus, though the

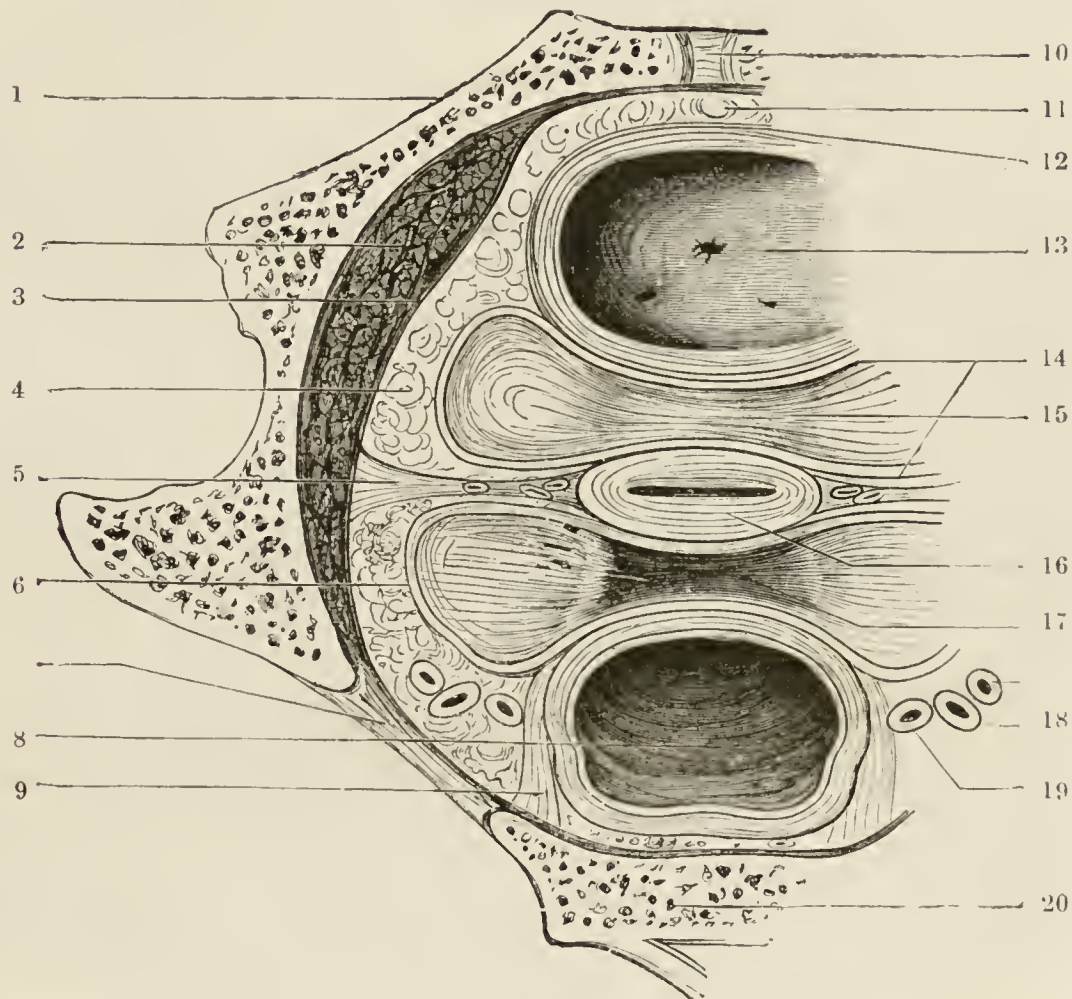


FIG. 22.—SECTION OF THE PELVIS SHOWING THE LIGAMENTS OF THE UTERUS.
(ANDERSON.)

1, Os pubis; 2, obturator internus; 3, obturator fascia; 4, sub-peritoneal tissue; 5, utero-pelvic ligament; 6, peritoneum; 7, sacro-sciatic ligament; 8, rectum; 9, utero-sacral ligament, running forward into recto-uterine ligament; 10, symphysis; 11, prevesical fat; 12, bladder wall; 13, vesical cavity; 14, peritoneum of utero-vesical pouch; 15, utero-vesical ligament and broad ligament; 16, uterus; 17, Douglas' pouch; 18, vessels; 19, ureter; 20, sacrum.

gland, as a rule, lies posteriorly and laterally in the pelvis, the left being in close proximity to the rectum, and about 1 inch from the uterus.

Cunningham gives the position of the ovary in the fossa ovarica as follows:—Its upper pole lies below the level of the external iliac vessels, and its lower end is placed just above the level of the peritoneum covering the pelvic floor. In front of the fossa ovarica is the obliterated hypogastric artery, and behind it the ureter and uterine vessels. Its inner surface is almost completely covered by the Fallopian tube, which arches over its upper pole, then, turning down, to the posterior part of its inner circle.

(* See also chapter on the diseases of the ovaries for the histology of the ovary.

According to Henle, there are some 72,000 Graafian follicles in the two ovaries. The escape of the ovules and the ovum gives us the false and the true corpora lutea. The process of ovulation is accompanied by the rupture of one of these follicles. These periodical ovarian enlargements are attended by increased flow of blood to the ovary, temporary congestion, and an increase in its weight. Should the Fallopian tube not grasp the ovary when this follicle has ripened and burst, the ovule may fall into the peritoneal cavity, or blood may escape into it. The ovary and the uterus have such intimate connections, both in their peritoneal coverings and in the arterial and venous supplies (the utero-ovarian arteries and veins), that any congested condition of the one must react on the other. This is seen in the contemporaneous and relative increase in size of the ovarian arteries and veins during gestation.

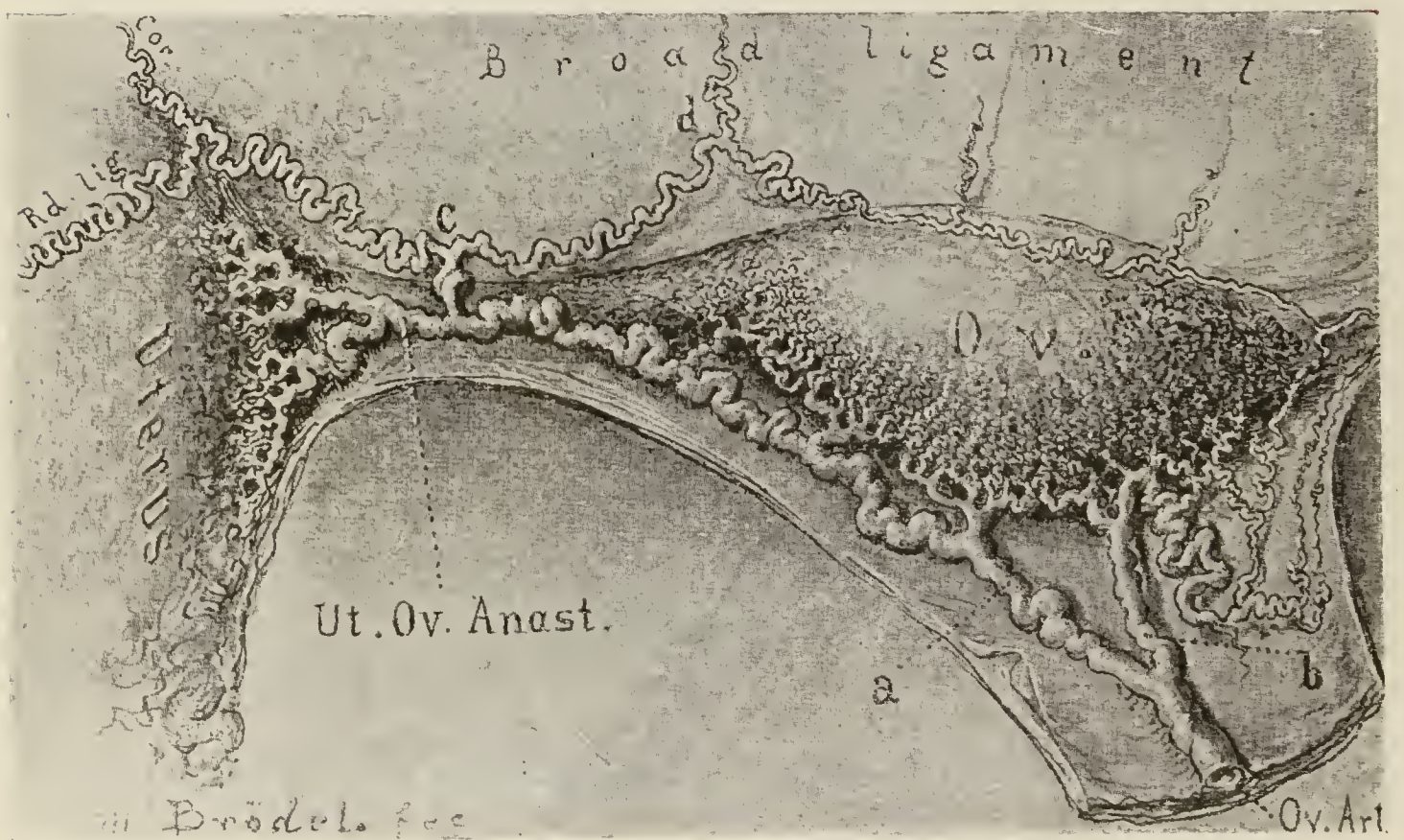


FIG. 23.—FROM HOWARD KELLY, SHOWING OVARIAN ARTERIAL SUPPLY AND DISTRIBUTION OF THE OVARIAN ARTERY.

Taking this vascular association of the ovary and uterus into consideration, with the equally close lymphatic distribution of both ovarian and uterine lymphatics through the lumbar glands, we have no difficulty in understanding how purulent and septicæmic processes commencing in the uterus influence the ovaries, or the manner in which such a condition as gonorrhœal inflammation, if unchecked, is generally attended by a greater or less degree of salpingitis and ovaritis. In the large vascular supply of the ovaries, and the periodical alteration in the quantity of blood circulating through the ovarian stroma—a blood-supply which is frequently depraved—we see a reason for the many morbid changes occurring in the ovarian tissues, and which are associated constantly with vicious menstruation. On the one hand, we find congestion leading to hypertrophy, hyperplasia, and sclerosis; ovarian apoplexy, rupture of vessels, the formation of cysts or fibromata; on the

PLATE A.

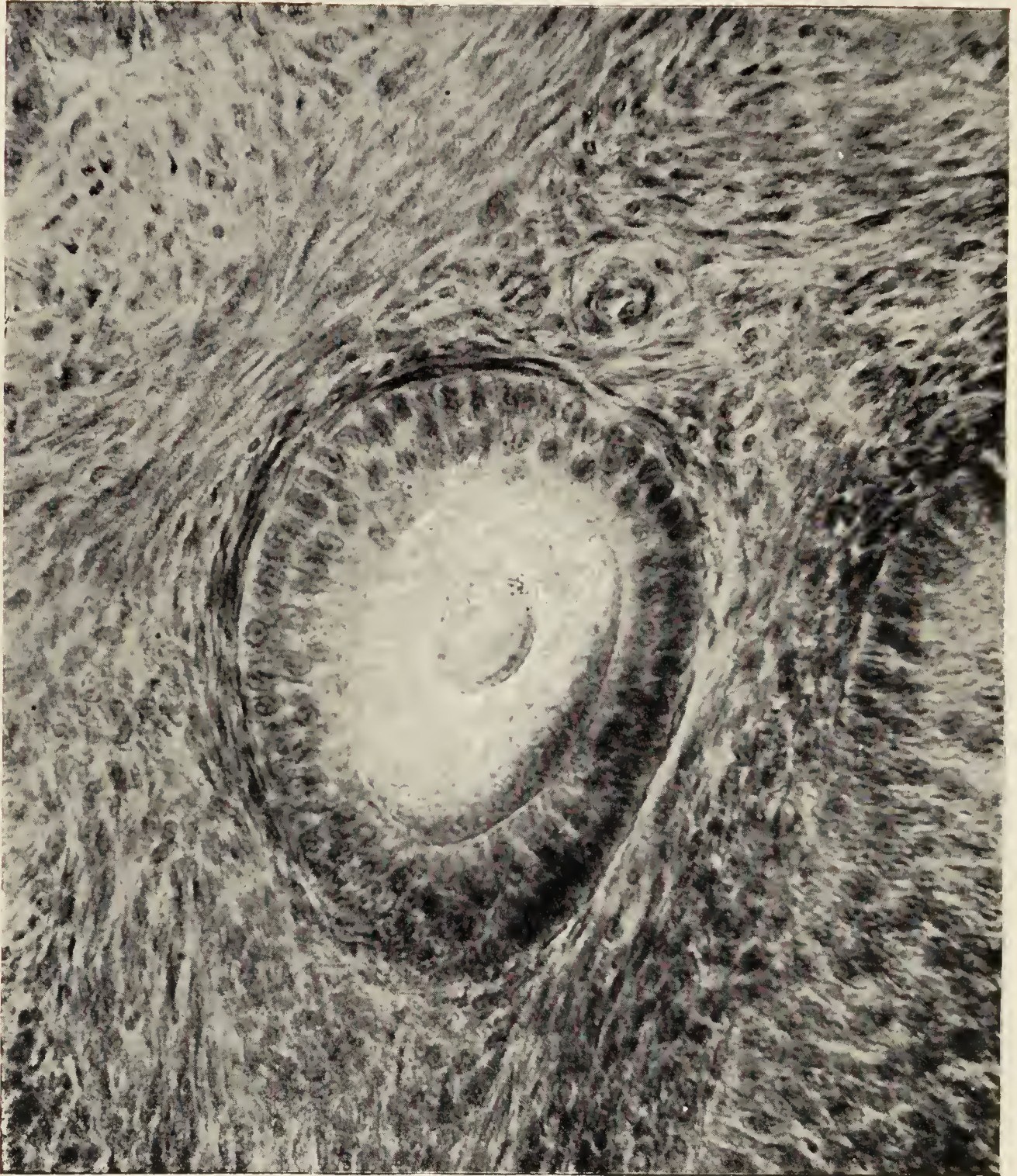


SECTION OF THE MATURE OVARY, ILLUSTRATING THE VARIOUS STAGES IN THE DEVELOPMENT AND REGRESSION OF THE GRAÄFIAN FOLLICLES.

Within some of the follicles the discus proligerus is clearly visible. Some have undergone cystic degeneration, while others are represented by corpora lutea in various stages of cicatrization. ($\times 30$ times.)

[To face p. 28.]

PLATE B.



HUMAN OVUM.

Shows under a high magnification (upwards of 400 diameters), a partially matured Graafian follicle lying in the ovary. In the centre is seen the nucleus of the ovum, containing a nucleolus, and surrounded by the granular protoplasm of the ovum. The zona pellucida—the hyaline limiting membrane of the ovum—is visible, though not yet fully formed. Outside it is the membrana granulosa, consisting, at this stage, of a double layer of cubical cells, with radially arranged nuclei. Most externally the ovarian stroma in the neighbourhood is becoming condensed to form the tunica fibrosa. The cells of the tunica granulosa have not yet commenced to form the liquor folliculi.

[To face p. 29.]

other, anæmic conditions tending to irregular, arrested, or suppressed menstruation.

Our knowledge of the physiological function discharged by the ovaries, and the intimate dependence of the woman's physical and mental health on the nature of the menstrual act, forces us to regard, as of primary importance to her physical well-being, the health of her ovaries, and the correct discharge of the function of ovulation. One of the greatest advances in gynæcological science was the operation of removal of the ovaries, first proposed by Battey, of Georgia, for inducing the premature change of life in woman, in various morbid states of both uterus and ovaries. With this step the name of Lawson Tait is inseparably connected, as he first insisted on the part played by the Fallopian tube in the act of menstruation, and the need for its complete removal together with the ovary, in the operation for removal of the uterine appendages.

Of late years the conservative operations on the ovaries and Fallopian tubes (to be fully described further on) have revolutionized the surgery of the adnexa. To remove only such adnexa as are diseased and dangerous, and to conserve, as far as possible, healthy organs, by resection both of the tube and ovary, are the principles which guide the surgeon.

It should be remembered that in rare instances the ovary descends to the labium following the course of the gubernaculum, or is arrested in the inguinal canal (*vide* Round Ligaments).

Ovulation and Menstruation.

Process of Ovulation—General Observations.—To comprehend any deviation from a normal and healthy act of nutrition of any organ, we must clearly understand the processes involved in the normal discharge of its functions, and the anatomical and histological facts bearing on that act of nutrition, from its incipient stage to its completion. To no physiological process does this rule apply more closely than to the deviations commonly met with in the menstrual act of ovulation. Perhaps the most perfect example of a nutritive process, elaborated through the healthful interchange of function, on the side of the circulating current on the one hand, and the tissues and the nerve elements on the other, is offered in the completion and perfection of the act of ovulation.

At a certain period of female life, varying generally from the twelfth year to the seventeenth, known as that of puberty, a sanguineous excretion occurs from the uterus.

I have, however, known several instances of menstruation occurring from the eighth to the tenth year. Barnes has recorded a case of a girl aged

eleven, in which the catamenia commenced at sixteen months and continued regularly. Mengus has reported regular menstruation in a child twenty-three months old. A case of menstruation on the second day after birth has been recorded by Thum. The discharge was sticky, and oozed from the vagina. On the third day of its appearance from one drachm and a half to two drachms of bloody mucus passed, the flow disappearing on the fifth day.*

Precocious Sexual Development.

In an interesting communication by Roger Williams,† in reviewing the subject of precocious sexual development, he gives interesting statistics bearing upon the first appearance of menstruation. Tilt places the average age of this in English girls at 14·92 years, and Emmet for American at 14·23. In the northern latitudes puberty is delayed, in the Esquimaux women, for example, as far as the twenty-third year. He adduces evidence to show that sexual precocity is occasionally associated with the development of morbid growths, a number of these occurring in the ovaries, several being of the sarcomatous type. Whereas girls have been known to conceive at eight years of age, the earliest age at which boys have proved virile is thirteen years. Statistics show that precocious development is more frequent in the lower races of mankind, and that it lessens with the evolution of the race and the advance of civilizing influences. Williams classifies the different types of sexual precocity as follows:—

- (a) Menstruation appearing prior to other signs of sexual evolution.
- (b) Precocious menstruation with the early appearance of other signs of puberty.
- (c) Sex manifestations without menstruation.
- (d) Early conception and pregnancy.
- (e) Sexual precocity with intra-abdominal tumour.

He records a number of cases in which menstruation began either at or shortly after birth, and several others from birth to the sixth month. Altogether he notes fifty-nine authentic cases of precocious development before the seventh year, and eleven cases in which the precocious development was associated with intra-abdominal tumour.

With Gelston Atkins, of Cork, many years since, I induced labour on the 250th day in a girl of twelve years of age. She was delicately formed, and the pelvis was narrow; the forceps had to be used. The child survived only a short time. The young mother, who was never told what was the nature of her 'tumour,' was kept under chloroform from the time labour set in; the milk was suppressed with belladonna, and, so far as I know, she never discovered the nature of the operation on her.

This menstrual flow is an outward and visible sign of the completion of the ovarian function of ovulation, or the full development of a Graafian follicle, its rupture, and the escape of the ovum.

* *Ann. Univ. Med. Sci.*, vol. ii., 1895.

† *Brit. Gyn. Jour.*, May, 1902.

Attendant on the first appearance of this catamenial flow, changes appear in the mental and physical nature of the girl: it is the springtime of her existence; and her whole system participates in the budding forth of her sexual life. There is a hyperæmia of her sexual and mammary organs. Local congestions may occur in the ovaries, uterus and rectum; remote excitations in other organs, as the brain, heart, and lungs; reflex disturbances, having their origin in the ovaries, and irritation of the ovarian nerves. This is the period of adolescence when the mental side of the woman imperceptibly changes, and temperament and character are more clearly pronounced. It is during these years of advancing girlhood that any manifestations of morbid mentalization have to be so carefully combated.

The recurring hyperæmia of ovary and uterus, with the associated vascular and nervous disturbances, continues for some thirty or forty years of the woman's life—her summer. And now we approach the critical autumn time, when this fertilizing process begins to wane, and gradually ceases altogether—the period of the menopause, from forty-five to fifty, or thereabouts, when again we find her subject to local and remote congestions, cerebral affections, vicarious hæmorrhages from various organs, cardiac complications; at the same time occur exaggerated reflex disturbances and nervous 'discharging lesions.' These accompany that 'change of life'* during which are developed those traits of womanhood which stamp with peculiar and characteristic features the period antecedent to the winter of old age. It is not, however, so much to the change in the uterine mucous membrane, and the periodical hyperæmia of the uterine tissues, with the consequent flow of blood, that we are to look for an explanation of these phases and phenomena. It is to the antecedent act of ovulation. True, a woman may menstruate (in so far as a mere periodical flow is concerned) without ovaries, but then it is most probably the mere perpetuation of a habit. As a physiological act it has lost its prime significance. It is on the ovaries rather than on the uterus that the gynæcologist has to concentrate his attention, in investigating the normal, and in treating the abnormal, menstrual molimen. We do not find any accurate explanation of many of the phenomena of menstrual life. There is something in these not to be explained by any anatomical or physiological facts connected with ovulation. The effect of its mysterious influence on the entire being of the woman may not be

* See remarks on the climacteric.

measured by any descriptive language. The explanation is not in the swollen and sensitive ovary, nor in any changes that occur in the parenchyma, in the maturation and rupture of the Graafian follicle, in the accompanying congestion of the Fallopian tube, nor yet in the swelling, proliferation, and disintegration of the epithelium of the uterine mucous membrane.

This strange coincidence, of a mental and physical state being closely dependent upon the healthful discharge of the function of a single organ, is best recognized when we watch the consequences of perverted action, or of any arrest or suppression of the ovarian function. 'The *essential thing*,' as Shroeder says, '*is the discharge of the ovum*;' the escape of blood from the mucous membrane is an accessory occurrence which is, perhaps, only the indication of the retrograde metamorphosis of that membrane. Conception may occur while the external evidence of ovulation is absent, as we have seen that the menstrual flow may periodically appear when the ovaries are removed. The congestion of the ovaries and other genital organs may take place with the discharge of the ovum, while there may be no laceration of the uterine vessels, and the usual escape of the disintegrated mucous membrane may not follow. From these brief remarks we can infer how important to the health and well-being of the woman is the due performance of the ovarian function. Though we may not regard the uterine changes and flow as of the same essential significance as those taking place in the ovary, yet, remembering the hyperæmic condition of, and the local determination of blood to, all the genital organs at the time of menstruation, we can comprehend how serious may be the consequences of a partial or complete suppression of this escape of blood from the uterus, the arrest of the normal process of disintegration and exfoliation of the uterine mucous membrane, and the resulting retention in the blood of the abnormal elements of excretion.

Senile Changes in the Ovaries.*

According to Otrosehkevitch, the lessening of both ovaries in old age arises in connection with increased growth of fibrous connective tissue and the predominance of this over the degenerating follicles. The disappearance of the epithelium covering the surface of the ovaries is a true change in the senile ovaries. The desiccation of mature, and the wholesale degeneration of the primordial, follicles are important factors in the change of the ovary of the aged. There is hyaline degeneration of the arteries and fibrous tissue

* *Vratch*, 1896, No. 5.

advancing with the age. Deficient nutrition of the ovary leads to fatty degeneration of the cellular tissue.

Menstruation generally occurs from puberty to the ages of forty-five or fifty, every twenty-eight days or at a longer interval (quite compatible with health). The discharge lasts from three to seven days, or longer. It consists of blood and disintegrated débris of uterine mucous membrane, the quantity of which varies with the duration of the flow. It is influenced by climate, temperament, coitus, habits and rank of life, temperature, blood-states (as the exanthemata, phthisis, Bright's disease, chlorosis, anæmia, leukæmia),* mental influences (as depression, shock, hysterical condition, the effects on the mind of illicit intercourse and seduction); local disorders of the genital organs and rectum (as fibroid developments, uterine version and flexion, hyperplastic states of the uterus); morbid growth of, or abnormalities in, the development and position of the ovaries; any congenital or acquired stenosis or atresic condition of the genital canal from the Fallopian fimbriated orifice to the vulva.

For the normal menstrual act to occur without any aberrant signs or symptoms, there must be perfect relation of blood-supply, both in character and quantity, and healthful control of nervous influence, not only on the part of the nerves distributed to the various tissues involved—arterial, muscular, cellular—but on that of the central nervous system. Nowhere is this made more manifest than in the influence exerted on the ovary and uterus during mental states, reflex disturbances, or shocks, which show their immediate effects in arrested and perverted menstruation. It is outside the scope of this work to enter into a detailed description of the physiological function of ovulation and the associated process of menstruation. This is more distinctly a portion of the physiological course of the student, and is dealt with in a more perfect manner in treatises on physiology than can possibly be done in a work of this nature. It must suffice to remind the reader of certain anatomical and physiological facts, connected with the act of ovulation, which bear on some of the clinical phenomena of menstruation, and the deviations from its normal occurrence, which the gynæcologist is called upon to treat.

* While the psychological importance of the establishment of the menstrual function in women who are mentally affected cannot be overlooked, the fact that the suppression of menstruation is often the consequence of the abnormal psychical state, and not its cause, has to be remembered. I refer to these psychological correlations further on in the chapters dealing with the correlation of sexual functions and insanity, and the operation of salpingo-oöphorectomy.

Various Views on the Physiology of Ovulation and Menstruation.

Landois and Stirling, in the 'Text-book on Human Physiology,' adhere to the views of Kundrat and Engelmann, that there is a fatty degeneration of the superficial layers of the mucosa, the new mucous membrane being developed from these deep layers when the period is over.

With regard to the relation borne by the ovaries in the menstrual function to both the Fallopian tubes and uterus, the following is a summary of these authors' views.

1. The partial contraction of the muscular tunic of the Fallopian tube assists in the propulsion of the ovum.
2. The bloodvessels of the Fallopian tubes are then injected, possibly by the constriction of the vessels in the broad ligaments, by their non-striated muscular elements. (Rouget.)
3. Pflüger's view is that the physiological 'freshening' of the uterine mucous surface affords nutriment to the newly received ovum.
4. Reichert's view (and that of Engelmann and Williams) is that the change in the uterine mucous membrane is a sympathetic one, resulting in sponginess, vascularity, and swelling. Thus is formed a *membrana decidua menstrualis*, which is not disintegrated unless the ovum be fertilized, and hence there is no external discharge, this negative sign being the proof of fertilization under normal conditions of health. The occurrence of ovulation and menstruation may not be synchronous, and hence there may be ovulation without menstruation, and *vice versâ*.

In connection with the anatomical process of ovulation, the views of Paul Strassman* are of interest. I am indebted for the translation to John Taylor and Frederick Edge.†

Ovulation can under certain circumstances take place before menstruation, the occasional occurrence of pregnancy in a girl who has never menstruated proving this. The spontaneously burst menstruation follicle is a bigger structure than that of the unburst follicle seen in ovaries removed by laparotomy. The translators have seen many follicles of 15 mm. in diameter. Sexual impulse and cohabitation can only be regarded as having a possible or questionable influence on ovulation. The ripening of the ovum and menstruation are always completely independent of sexual congress (Bischoff, Negrier, Raciborsky, Bouchet). Rupture of a follicle, and its dehiscence, may be accelerated by connection. Each menstruation is the expression of an ovulation. The uterus being dependent upon the ovaries for development and growth, it is only a step to conclude that heightened activity of the ovary calls forth a corresponding life expression of the uterus. In both this is periodical, so, consequently, is menstruation. It is a rhythmic life expression. Anatomical examinations on the number of corpora lutea, contrasted with the number of known menstruations, established the connection between ovulation and menstruation, a connection still further established by a majority of post-operative reports, which point to the same fact. Disturbances

* *Archiv. f. Gynak.*, bk. 52, ch. 1, 1896.

† *Brit. Gyn. Jour.*, p. 11, vol. xii.

in the position and diseases of the adnexa may cause deviations from the normal rhythmic menstrual act. Hence, intermenstrual pain was explained by Fehling as a normal ovulation between two menstrual periods. How common such pain is every gynæcologist is aware, and the relief of this symptom, as well as the pain of ordinary menstruation, by treatment of the ovaries, or their massage, is explained by the consequent changes of the relative position of the adnexa and uterus. A light is thus thrown on the different results which may follow the forcible and exhaustive examinations of the adnexa under anæsthesia. Other authorities, as Slavjansky, Leopold, Miranoff, and Pflüger, regard ovulation and menstruation as quite independent events, menstruation being, according to these, a self-standing physiological phenomena, and various explanations have been advanced to explain the cases where menstruation takes place without ovulation. Leopold distinguishes between typical corpora lutea and atypical, the latter arising from unburst follicles whose walls have fallen together and only contain a little blood clot. Taylor and Edge regard these latter corpora as pathological, and due to their removal from cases which had been operated upon, and they contend that evidence of the retention of an ovule on the follicle is wanting. Leopold and Miranoff adopt Pflüger's view that the movement of menstruation is due to the steady growth of the follicles, or the predominating growth of one follicle, a powerful blood congestion of the genitalia occurring, followed by menstrual changes in the uterus, and the secondary bursting of the follicle. Pflüger, in explanation of the periodicity of menstruation without ovulation, says that 'menstruation occurs without ovulation when no large corpus luteum happens to be present,' and he adopts the 'theory of a dynamic equilibrium of all organs, from which it follows that the ovaries carry a definite number of stimuli to the central nervous system any day.'

But, as the translators observe, recurring menstruation of a healthy woman is recognizable, that of ovulation is not; nor is it certain that the condition of the mucous membrane of the uterus in relation to expected conception can be regarded as normal. They hold generally to the view that the shedding of the ovum is periodical, like menstruation.

Menstruation, according to Strassman and others, is not an independent life expression of the uterus, and the bursting of the follicle is not due to menstrual congestion. Pregnancy occurs in amenorrhœic women, in children who have not menstruated, exceptionally in the menopause, and during lactation. There is no sudden evolution of the follicle, vascular development of the ripening process going on *pari passu*.

Other important points which are established in the work quoted are—

(1) That the opening of the follicle occurs independently of menstruation (Reichert, Leukardt, Waldeyer). Periodical increase of the ovarian activity, with swelling of the ovaries every fourth week, was noticed by Werthe in a case of hernia of the ovaries. The same fact was recorded by Englisch.

(2) That the ovaries decrease in volume during menstruation (Morell-Lavalle, Verdier, Barnes, Oldham). Blood pressure is reduced in the intermenstrual period. Palpation of the ovaries (Von Holst, J. Meyer) is easier during menstruation owing to their swollen condition. Hyrtl found a minute ovum in the interstitial portion of the tube on the fourth day of menstruation, long after the rupture of the follicle.

(3) It has been established (Leopold, Williams, His, Reichert) that a period of about two days may be taken as that generally occurring between the bursting of the follicle and menstruation.

(4) By a series of experiments, and the production of artificial ovulation in dogs, Strassman claims to have established that ovulation is the cause of the changes in the endometrium and genitalia observed during menstruation. Such changes are the consequence of excitation of the ovarian nerves, causing reflex vaso-motor excitation in the uterine arteries, and these nerve, and ganglionic and nerve, irritations proceed in the duly provided paths (Rohrig). The nerve supplies of the ovaries and the ganglionic relations to the vessels favour these processes.

(5) The period of incubation from the rupture of the follicle until the appearance of menstruation is the time occupied in the development and completion of these physiological ovario-uterine changes. We find its analogues in the appearance of lactation, and in the pseudo-menstruations after operations.

As the result of his investigations on monkeys, Bland-Sutton came to the conclusion that the mucous membrane is not disintegrated to the extent previously represented, and that only the epithelium is shed, while the utricular glands are enlarged, and blood is discharged from the denuded epithelial surface. Arthur Johnstone* regarded the endometrium above the os internum as a cytogenic membrane and belonging to the class of so-called adenoid tissues, 'menstruation being for it what the lymph-stream is to the lymph-gland, or the blood current to the spleen.' He gave as the simplest definition of menstruation, 'a periodic wasting of those corpuscles that are too old to make a placenta.' The epithelium alone is shed, and the mucous membrane is not disintegrated. 'The Fallopian tube undergoes no structural change during menstruation.'

Lawson Tait, from careful dissections of the ovaries, noted the condition of the corpora alba and corpora lutea. In all, the ovaries were practically destroyed. He came to the conclusion, from these dissections, that in menstruation we are dealing with a function associated with the uterus and Fallopian tubes, inasmuch as menstruation and ovulation were only 'coincident' in twenty-six out of the fifty-one women; in seventeen they were not coincident; eight were doubtful. Such pathological evidences do not appear to me to invalidate the clinical importance of other physiological facts that establish the relationship between ovulation, at whatever time it takes place, and the menstrual flow. Lémère explains such persistence of menstruation after removal of the ovaries and tubes by an organic habit of the nerve-centres and uterus, enabling the latter to discharge the function.

Byron Robinson has ascribed the aberrations of the menstrual functions in women to the nervous supplies of the ovaries and uterus, arising in what he terms 'the abdominal brain,' and the renal and abdominal plexuses of the sympathetic nerve. This source of nerve-disturbance is in a condition of hyper-excitation at certain times, especially during the menopause. During this time the woman suffers from perverted nutrition in her sexual organs, and slight peripheral excitations are sufficient to originate reflex disturbances.

* *Proceedings of the British Gynæcological Society*, June 23, 1886.

The obvious deduction to be drawn from these physiological correlations is, that while soothing any local painful and irritating states in the organs within the pelvis, we have often to look outside these to the general nervous system for collateral visceral neuroses elsewhere during the critical times of puberty and the climacteric.

Martin of Birmingham insists on the dependence of menstruation on a special nervous supply, issuing from a special nerve-centre in the lumbar portion of the spinal cord, the arrest of the function after oöphorectomy depending upon section of the menstrual nerve. He believes that either the pelvic splanchnics or the ovarian plexus are the roads through which the menstrual impulses travel to the uterus. He urges that all the physiological facts connected with menstruation point to this control by a special nerve-centre.

‘We thus see that during the period between the follicular rupture and the appearance of menstruation, momentous changes are occurring in the ovarian and uterine vascular connections.* An important part is played not only in the rhythmical occurrence of the act of ovulation and its menstrual attendant, but also in its character and quantity, as well as in the nervous phenomena attendant upon it, by the vasomotor supplies of the genitalia through the renal, abdominal, and pelvic plexus. The normal nutritive balance maintained during the interval is disturbed before the onset, and, as a consequence, a perverted metabolism is induced in the internal genitalia. This culminates in the disintegrating process with its associated discharge from the uterine endometrium. The katabolic activity is provided for through the free supply of blood from the ovarian and uterine arteries, the large uterine and ovarian veins, the larger outlets in the broad ligaments, and the ramifying plexuses of lymphatics, which make their way to the pelvic, lumbar, and inguinal glands. The generative forces acting after fertilization of the ovum, or in the maturation of the follicle, and the anabolic manifestations occurring prior to its maturation, are doubtless, as many believe, under the control of a special cord-centre in the lumbar region—the generative or sexual brain; but the clinical facts are numerous which point to the inhibitory influence exerted by the mind and the various psychical excitations on both the constructive and destructive forces at work in the evolution and involution of the entire process.’

‘Menstruation has thus, for clinical purposes, to be regarded in the light of a complex train of cyclical physiological phenomena, involving various structures in distinct but intimately correlated parts, manifesting themselves in rhythmical regularity and sequence.

* From ‘Practical Points in Gynæcology,’ by the Author, 3rd edition, 1902.

This cyclical and rhythmical sequence is subject to interferences which have their commencement at times within the organ in which these processes originate, or are determined by extragenital abnormal conditions, present either in the nervous or circulatory systems, or the various organic changes which have taken place in such viscera as the brain, heart, liver, spleen, or kidney.'

Pseudo-menstruation.

These explanations of pseudo-menstruation are given :—

In the case of large tumours the overfilling of the vessels of the pedicle (Olshausen) leads to congestion and bleeding. The weakness of the heart action and the reduction of the intra-abdominal pressure may assist this overflowing of the uterine vessels. The view of Issmer and Veit is, that by the removal of the ovary with a ripe follicle we practically induce the menstrual act, and the incubative period explains the delay in appearance.

All these arguments support the view always advocated in previous editions of this work, and reiterated in the present, that from the ovary, through its physiological function of ovulation, is issued the mandate for the visible act of menstruation to commence, and that it is to the ovary rather than to the uterus we have to look for the explanation of the various physiological and clinical phenomena which at puberty, in adult life, and at the menopause, are centred in the appearance of the menstrual act.

Transplantation of the Ovaries.

So far back as 1899 J. F. McCome came to the following conclusions from a series of experiments on thirty animals :—

(1) That contact between ovary and tube is not essential for conception. (2) That ovaries grafted from one part of an animal to another part of it continue to grow and functionate, so that pregnancy can and does occur. (3) That an ovary grafted from one animal to another of the same species continues to functionate, so that pregnancy can occur. (4) That ovaries grafted from one species to another continue to functionate, and appear to prevent post castration atrophy of the tubes and uterus. (5) The best results are obtained when the raw surface of a transplanted ovary is sewn to a denuded surface.*

In 1901 Knauer, Roxas, and Lookashevitch† arrived at similar conclusions. The former asserted that complete ovulation might occur, and conception and pregnancy, after transplantation. In sheep the transplanted

* *Amer. Jour. Obs.*, Aug., 1899.

† *Archiv. di Ost. e Gin.*, June, 1901; *Vratch*, 1901, No. 29.

ovaries continue to produce mature follicles and ova. The first suggestion was that the ovary should be planted in the loose extra-peritoneal tissue, or introduced into the pelvic intra-peritoneal cavity per vagina. In transplantation necrosis is avoided by having a small pedicle for fixation purposes, none of the sutures being carried through the ovarian tissue proper. Lookaschevitch suggested that the ovaries should be sutured as nearly as possible to their places in the broad ligament. The transplantation, according to him, is not, as a rule, durable, atrophic and degenerative changes occurring in the transplanted ovaries. Both he and Roxas maintain that the physiological effects of castration are at least retarded by the transplantation.

F. H. Martin, in July, 1903, also arrives at the same conclusions, and that menstruation will continue, in women and monkeys, after homo-transplantation, and that conception has followed it in women. Also, that ovaries transplanted to other than normal situations maintain their vitality and functionate.*

The Internal Secretion of the Ovary.

Curatullo and Tarulli † have reviewed the entire question of the influence of oöphorectomy upon the metabolic phenomena in the organism, as, for example, on the respiratory products, the body weight, and the elimination of phosphates, and have arrived at the conclusion that removal of the ovaries has a marked influence on metabolic phenomena. The greatest effect is on the elimination of phosphorus, which is diminished; the elimination of carbonic acid, and the absorption of oxygen by respiration, diminish up to a certain point, and then remain in the same proportion without further change. The body weight is increased. The diminution of phosphates after oöphorectomy has suggested to Schauta and others this operation with or without removal of the uterus as a cure for osteomalacia, which Fehling has attributed to exalted ovarian functional activity, and consequent reflex effects on the vaso-dilators and constrictors of the medulla. There is a resulting increase of reabsorption of the calcareous salts, more particularly of the pelvis. The disease is a reflex tropho-neurosis of the skeleton, having its focus of reflexion in the ovary. The conclusions arrived at are:—

‘The ovaries have, like other glands of the system, according to Brown Sequard’s general law, an internal secretion. This is passed constantly into the blood, its chemical constitution being quite unknown, while its most essential characteristics are those of favouring oxidation of organic phosphorized bodies, of hydrates of carbon, and of fats. Hence it follows that (by removal of the ovaries or absence of their function, as before puberty and after the climacteric) there ought to be, on the one hand, a greater retention of organic phosphorus, and thus a greater accumulation of calcareous salts in the bones; and, on the other, the well-known occurrence of obesity following on castration or the menopause.’ ‡

* *Chi. Med. Rec.*, July 13th, 1903.

† *Annali di Ostetricia Ginecologia*, Oct., 1896; *Brit. Gyn. Jour.*, Feb., 1897.

‡ *Brit. Gyn. Jour.*, Feb., 1897.

It is not to be forgotten that the uterus is capable of contraction under the influence of sexual intercourse, and the expulsion



FIG. 24.—UTERUS DURING MENSTRUATION.
(GALLARD.)

A, mucous of the neck; B, mucous of the body;
C, thickness of the mucous; D, tissue proper; E, thinning of the neck and at the Fallopian tubes.

of some of the uterine mucus may thus take place. This reflex contraction may be associated with corresponding contraction of the Fallopian tubes. This has an important bearing on the question of sterility and the effect of excessive or imprudent intercourse, which may thus cause loosening or expulsion of the ovum.

A married lady, under certain influences, had violent uterine contractions, generally associated with the catamenial periods, in which the vagina participated. The uterus was driven down to the vulvar orifice, and it was difficult to keep a speculum

in the vagina. A digital examination was sufficient to bring on these contractions. Fearing that there might have been some intra-uterine polypus or fibroid, I dilated the uterus and explored the cavity, but there was no intra-uterine growth. She suffered from an old laceration of the cervix and some corporeal endometritis and menorrhagia. Free application of nitric acid to the uterine cavity materially benefited her, and relieved the spasms.

The Rectum.—In practice, the close sympathy that exists between the uterus and the rectum is often overlooked. I enter into the practical bearings of this sympathy on rectal operations in the chapter on the 'Rectum.' The habitual neglect of the lower bowel, which is frequently met with in women, is the cause not only of constitutional, but also of many local disorders. Various dyspeptic troubles—headache, flatulent pain, functional heart palpitations, hæmorrhoids—follow from a congested portal system. A congested, hæmorrhagic, or an unnaturally dry, condition of the mucous membrane is constantly found as the companion of different vaginal and uterine disorders. One organ reacts on the other, and the

recognized difficulty in curing any rectal affection while a uterine diseased state continues, renders it imperative to relieve the former before we can hope permanently to benefit the latter. This is especially true of fissure, strictured states, fistula, ulcers, pruritus. But perhaps the complication most commonly met with is hæmorrhoids, both external and internal. These are more distressing when there exists at the same time any version or flexion of the uterus, particularly retroversion, the uterine pressure aggravating the rectal pain and discomfort. A rectocele associated with uterine prolapse or injury to the perineal body is a not uncommon complication. The rectum is encroached on, and the act of defæcation is interfered with, in pelvic peritonitis with effusion, uterine fibroids, and by various accumulations in Douglas' pouch. In making our first thorough pelvic examination, having previously by an enema emptied the rectum, we often gain our most important information by a careful rectal exploration. (See 'First Steps in Examination,' and 'Remarks on Rectal Exploration in Children.')

The Appendix Cæci.—So frequently is the appendix involved in diseases of the adnexa, and so commonly has it to be removed in operations on the pelvic viscera, that its positions in the abdomen have to be carefully studied. Cunningham gives three principal directions in which it runs:—(1) Over the brim into the pelvis. (2) Upwards behind the caecum. (3) Upwards and inwards towards the spleen.' In the first situation it hangs over the pelvic brim; in the second, the caecum must be turned upwards in order to expose it; and in the third, the end of the ilium and the mesentery must be raised in order to display it. (Cunningham, *loc. cit.*) I myself have recorded a case in which it was attached to the bottom of the pelvis, and another in which it was attached to an ovarian cyst *reaching to the iliac fossa of the left side.*

Appendical Complications.*—The relation of appendicitis to tubal inflammation and infection of the adnexa has not had accorded to it the importance that it deserves. From many recent observations two things are evident. First, that infection of the adnexa results in a fairly large proportion of cases from a diseased appendix. Archibald Maclaren† has published an interesting paper on this topic, and Laphorn Smith has reported cases of ectopic gestation in which the gestation sac was distinctly infected through the appendix.

* See also chapters on Pelvic Inflammation, Myomata, and Fallopian Tubes for further references to Appendical Complications.

† *Amer. Jour. of Obstet.*, July, 1900.

Some years since I attended a case in which the differentiation of appendicitis from salpingitis was difficult, the earlier symptoms being those of salpingitis, with an adnexal tumour at the right side. These were, however, quickly masked by those of appendicitis. I urged *cœliotomy*, but consent would not be given. When the surgeon who had charge of the case did finally operate, it was found that the bowel was ruptured, and there were several hard concretions in the appendix.

The second point with regard to the appendix is, the danger of post-operative adhesions with involvement of the appendix causing subsequent pain and disappointment to the patient. Noble has shown the large number of cases in which appendical trouble complicated the *oöphorectomy*. The lesson we learn is, the need for careful disposal of the appendix in every case of *salpingo-oöphorectomy* or ovarian resection, with the need for complete covering of the pedicle with peritoneum, and early movement of the bowel after operation.

There is the not uncommon yet most serious error of mistaking the earlier symptoms of appendicitis for inflammation of the adnexa and pelvic peritonitis. I have seen some fatal errors arising from this mistake, with the consequence that perforation occurred from a fulminating appendicitis before any operation was proposed. At the same time it is well to bear in mind the possible occurrence of some form of ovaritis or salpingitis, side by side with the appendical inflammation (Plate I.).

Case of Complete Absence of the Internal Genitalia * discovered through an Attack of Appendicitis—Fæcal Fistula—Recovery.

The following case, in which an appendical abscess was unexpectedly discovered by *cœliotomy*, is of considerable interest. It exemplifies the great importance of rectal examination for disease of the pelvic viscera in young children, as also the obscure nature of the symptoms which may usher in or attend upon an appendical attack or abscess. Apart from this, it shows how mistaken we may be in our diagnosis even after a most careful examination under *anæsthesia*. Again, it proves how rapidly a fæcal fistula may close. The position of the appendix also, and its attachment at the bottom of the pelvis, was peculiar, and the case is also worthy of record from the complete absence of the internal genitalia.

An active, healthy child had had no previous illness, when she was suddenly seized one afternoon with abdominal pain, which lasted for the entire night. Treatment did not relieve the attacks of colicky pain and pyrexia which followed. I saw her for the first time ten days after the first symptoms set in, and examined her under an *anæsthetic*. By the vagina,

* For other examples of absence of the genitalia, see chapter on 'Atresia of the Vagina.'

PLATE I.



APPENDIX, FALLOPIAN TUBE AND CYSTIC OVARY. (AUTHOR.)

The removed concretion is the natural size. The second is seen filling the lumen of the appendix. Recovery. (See page 43.)

PLATE II.



AN OVARIAN CYST WITH OMENTAL ADHESIONS ABOVE AND AN ADHERENT VERMIFORM APPENDIX BELOW. (KELLY.)

[To face p. 42.]

bi-manually, both supra-pubically and through the rectum, no uterus could be detected, nor any evidence of adnexa. This was made quite clear by the most careful recto-vesical examination. Through the rectum, above the vagina (not so well felt through the latter), a soft tumour or mass could be discovered, rather sausage-shaped. I could not decide what the nature of the tumour was, but thought it might be a soft dermoid cyst of a rudimentary ovary. I advised abdominal exploration, and on the 28th I opened the abdomen. I found the bowel generally in an injected and congested condition, with some soft peritoneal adhesions here and there. These were more particularly apparent at the left side and in the neighbourhood of the sigmoid, in which was a faecal mass doubled over the rectum, evidently that which I had felt through the bowel. No uterus or adnexa was discoverable. *The appendix was carried down to the bottom of the pelvis, where it was fixed by adhesions.* It was about six inches in length. On rupturing the adhesions which attached it some pus escaped. The appendix was removed, and the infected portion of the pelvis having been cleansed with formalin solution, the abdomen was closed, an iodoform drain being left. Things went on fairly well until the fifth day after operation; the long drainage gauze having been removed and a shorter inserted. On this day some faecal discharge was perceived coming from the drainage opening in the abdominal wound. The opening was carefully cleansed and kept patent, but was not otherwise disturbed. On the eighth day after operation the bowels were acting satisfactorily with enema, the wound was healing, and there was neither faecal matter nor discharge. From this time the progress of the case was uninterrupted, with the exception of an attack of cystitis, from which she perfectly recovered.

Adherent and Enlarged Appendix containing Concretions complicating Cystic Ovary.

In a recent oöphorectomy I found the right cystic ovary had formed for its entire length a firm union with the appendix. The latter, greatly enlarged, and marked by constrictions, was removed, separately from the ovary, and in it were found two hard, smooth concretions, the size of beans. The complication explained the associated abdominal and pelvic pains which had previously affected the health of the patient for some years before operation (Plate I.)

The Urinary Organs—Difficulties in Diagnosis.—The gynæcological student must have a sound practical knowledge of the anatomy of the kidneys, ureter, and bladder. The more gynæcological surgery advances the more we see the importance of such an accurate acquaintance with the position and relation of these viscera. Various morbid states of the kidney, such as movable kidney, hydronephrosis, pyonephrosis, perinephritic abscess, and cystic disease, are liable to be mistaken or overlooked in diagnosis. It is a matter of common occurrence for renal disease to complicate

pelvic disorders. It is often extremely difficult to differentiate between the two. The same observation applies to the differentiation of renal and hepatic enlargements or tumours of these viscera. The frequent occurrence of a renal calculus giving rise to various reflex or transferred pains; the possibility of a renal tumour being mistaken for an ovarian cyst; the different morbid conditions for which movable kidney is liable to be mistaken—such, for example, as malignant disease of the colon, tumours of the gall-bladder, fæcal tumours, splenic tumours—are instances of this (see chapter on ‘Renal Disorders’).

Case of Congenital Hepatoptosis—Liver completely displaced and reaching to the Right Groin.

In a case of mine, the supposed enlarged kidney, the edge of which could be felt closely simulating the margin of the spleen rather than that of the kidney, proved to be a completely displaced liver (hepatoptosis). The patient, who had some time before been almost *in extremis* from hæmatemesis, had been treated for gastritis and gastric ulcer. On abdominal exploration, I found the liver *lying completely at the right side*, the gall bladder displaced from its position, the free margin of the liver lying forwards, the organ being healthy, but congested, and reaching to the right inguinal region. The abdominal viscera having all been carefully examined, and the liver replaced in its position, the abdomen was closed, with the curious but pleasing result that since the operation the patient has been in excellent health.*

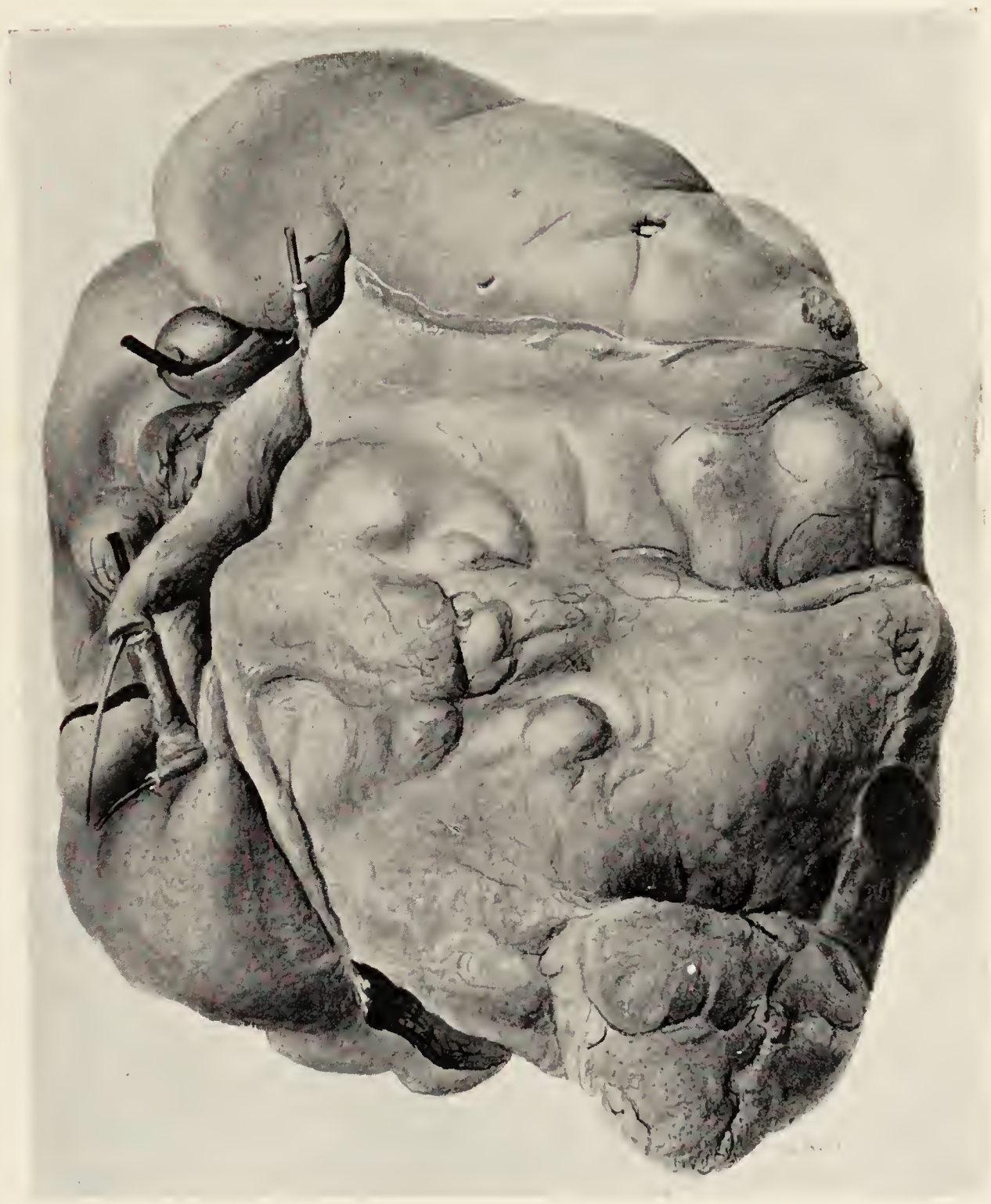
Suppression of Urine following Shock—Hepatoptosis simulating Hydro-nephrosis.

Shortly after this was written I saw a case of suppression of urine which lasted for eight days. A large bossy swelling at the right side I thought was a hydro-nephritic accumulation. The suppression had followed removal of a large uterine polypus by means of forceps. No urine passing, and there being no cause for any obstruction in the ureters, I was puzzled to account for the hydro-nephrosis. Everything having been done to promote the secretion of urine, and the swelling at the right side becoming larger, and aspiration having failed to draw any fluid from it, I advised exploration, and, on opening the abdomen, I found that the tumour was a completely displaced liver, the lower border of which reached to the groin. The kidney behind it was quite healthy. The woman died from the suppression.

But it is especially in view of the various operative procedures that have of recent years been undertaken for the relief of renal affections, both in the kidney itself and the ureter, that the gynæcologist must remember his responsibility, as physician, in

* *Trans. Med. Soc.*, vol. xxi., 1898.

PLATE III.

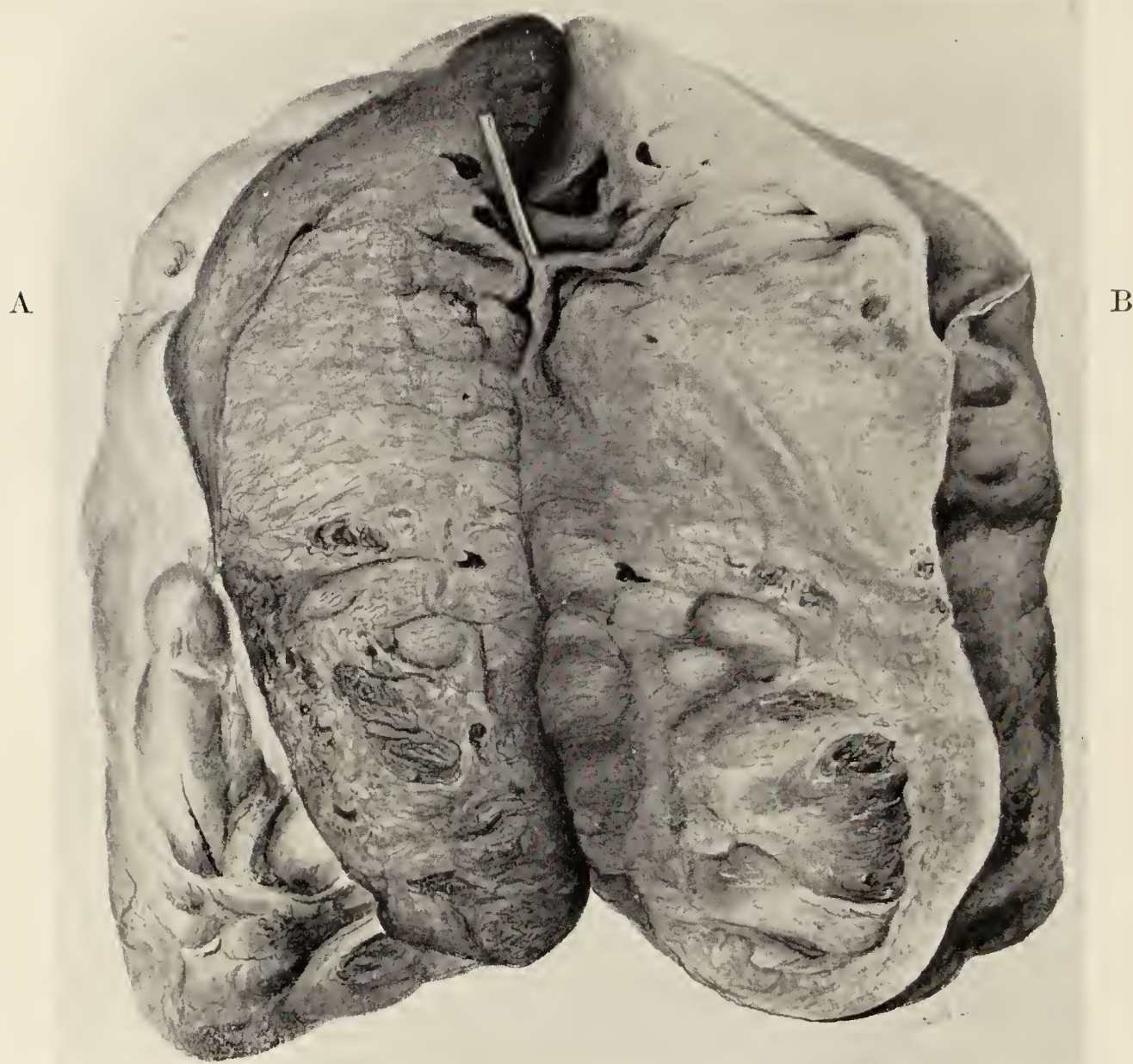


CARCINOMA OF A LARGE MOBILE KIDNEY. (AUTHOR.)

The hilum and the renal veins are invaded with new growth; the ureter is healthy, and is seen cut across. Nephrectomy. Recovery. (Page 45.)

[To face p. 44.]

PLATE IV.



THE SAME KIDNEY SHOWN IN SECTION. (AUTHOR.)

The area of healthy structure is limited by a line drawn from A to B.
Nephrectomy. Recovery. (Page 45.)



SECTION FROM CARCINOMATOUS AREA.

[To face p. 45.]

diagnosing the disease, and advising an operation, or as surgeon in performing it. Only those who are frequently called upon to make a diagnosis can realize the difficulty there is in arriving at an accurate conclusion in some obscure cases of renal disease if they be complicated with evidence of pelvic mischief, either remote or immediate. The vital importance of extreme care is obvious, as life may be sacrificed from the want of a simple exploratory incision, or the use of an aspirator.

Mobile Kidney—Complicating Uterine Disease—Persistent High Temperature—Supervention of Carcinoma—Nephrectomy.

The plates (II. and III.) show the right kidney removed by nephrectomy from a lady aged 40, one year after her first pregnancy. There had been a brown discharge from the uterus for a year, with cessation of the catamenia. During the entire year there was a constant nightly exacerbation of temperature, and uterine disease being suspected, she was curetted. At the same time she had an enlarged and movable kidney. Her symptoms not being relieved by curettage, exploration of the kidney was suggested. She had never had hæmaturia, and there was nothing in the uterus indicative of malignant affection. The uterus and adnexa being healthy when I saw her, and the uterine tumour having increased in size, I suspected, from the emaciation and sickness, which were increasing, that the case was one of sarcoma. The kidney was removed by Langenbuch's operation. She made an excellent recovery and put on flesh. Some eighteen months after the operation disease recurred in the peri-renal tissue, and she died within two years from the primary operation.*

Summary of the Pathological Report.—The specimen consists of an enlarged right kidney, weighing $26\frac{1}{2}$ ozs., and measuring 7 inches in length, and 11 inches in its greatest circumference. The enlargement is due to the presence of a new growth, which involves the lower two-thirds of the organ. This growth has a nodular surface, and is closely adherent to the fibrous capsule of the kidney, though it has not perforated the capsule. The hilum shows that the renal veins and pelvis are plugged with new growth. The cut surface shows that the renal substance is entirely replaced by growth at the lower end of the kidney. Microscopically, the growth is a very soft and degenerated carcinoma.

Microscopical Report.—The growth itself is a carcinoma of the 'convoluted tube' type, that is to say, it reproduces the epithelium and general arrangement of the convoluted tubules more or less distinctly. Some of the alveoli have a lumen, and are even dilated into minute cysts, which present simple villous ingrowths or papillomata. The majority of the alveoli are, however, solid, and are separated by thin strands of fibrous tissue traversed by capillary vessels. A noteworthy feature of the growth is the marked fatty degeneration of the cells; this is shown by their empty, unstained condition, due to the removal of the fat in the course of preparation of the specimen.

* For particulars of case, see *Brit. Gyn. Jour.*, Aug., 1897.

The case shows the care with which the differentiation of renal tumours has to be made. It demonstrates the importance of mobile kidney complicating disease in the uterus or adnexa. It also has a bearing on the influence this complication may exert on a difficult diagnosis when renal and pelvic disease are associated; and it is of great interest to the gynæcological surgeon, both from its clinical and pathological aspects.

Ureters.—The surgical anatomy of the ureters has of recent years come to have a special importance to the gynæcologist.* This has resulted from the surgical measures necessitated by the implication of the ureters in affections of the pelvic viscera, and the various operative measures which have been taken by different

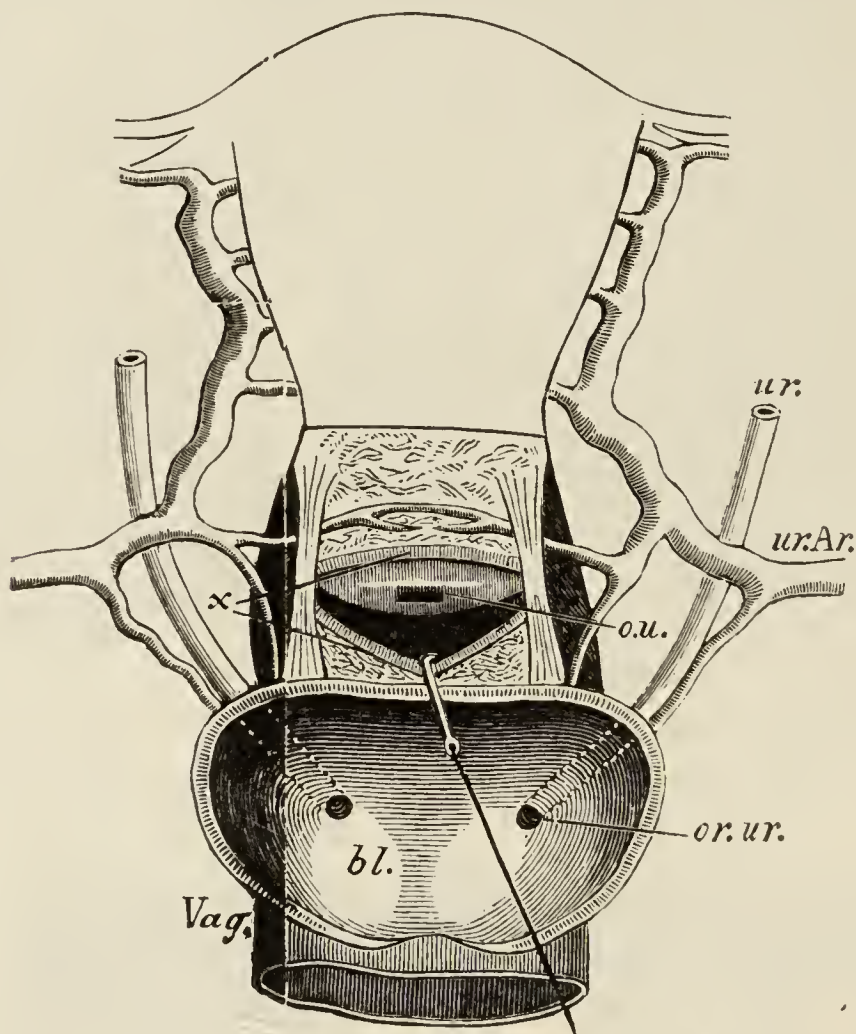


FIG. 25.—SHOWING RELATION OF UTERUS TO UTERINE ARTERIES, URETERS, AND BLADDER. (GREIG SMITH.)

operators to avoid injury to them, or to repair them when accidentally or unavoidably wounded. Also, the examination of the bladder by cystoscopy, and the catheterization of the ureters for diagnostic purposes, demand a correct acquaintance with their position, cystic openings, and relations. The following is Collier's and Morrison Watson's description of the course of the ureters:—

‘ Entering the pelvis, the ureter crosses the common iliac near its bifurcation,

* See chapters on Myomata and Uretal Surgery.

and then runs downwards and forwards in front of the internal iliac and its anterior division. Where this division of the internal iliac splits into its branches, the ureter bends backwards, and is crossed on the inside by the uterine artery. The ureter then turns forward at the level of the internal os, and, at a distance of about half an inch from it, runs along the side of the vagina for a little way, finally bending over it so as to enter the junction between the vagina and bladder. It perforates the latter organ just above the middle of the anterior vaginal wall, and obliquely enters the viscus a little lower down.'

Howard Kelly, to whose ingenious method of exploration of the bladder we shall refer again, has added to the knowledge gained by the work of Grünfeld, Newman, Pawlik, Sänger, and Schultze, and I quote here his admirable description of the course of the ureter:—

'The ureters are flattened white cords, about 0.5 cm. in diameter, from 25 to 30 cm. in length, extending from the pelvis of each kidney high up in the loins under the vaulted arch of the thorax down to their embouchure in the urinary bladder. Each ureter is naturally, and for practical purposes, divided into two parts—an abdominal and a pelvic portion—by the bend over the common iliac artery at a plane about 3 cm. above the brim of the superior strait.

'The pelvic portion is not more than 10 or 12 cm. long, while the abdominal portion is from 12 to 15, or more.

'The most inaccessible portion is that nearest the kidney, where it lies concealed by the ribs, from 4 to 4.5 cm. from the median line, and about the same distance posterior to the anterior face of the vertebral column.

'The middle part of the abdominal portion lies from 2.5 to 3 cm. from the median line, on the psoas muscle, on a plane on a level with the anterior faces of the vertebral bodies. The ureter crosses the psoas obliquely to the internal iliac artery at or just above its bifurcation, where it is about 3 cm. from the middle of the promontory of the sacrum. The course is thus obliquely downward and inward, exhibiting a slight inward convexity, and always with marked convexity forward, due to its course over the psoas.

'The ureters lie in the loose cellular tissue back of the peritoneum, and partly under the caput coli and the ascending colon on the right, and descending colon and sigmoid flexure on the left side.

'The abdominal ureter holds no relations to important vessels until joined somewhere about or above the middle of its course by the ovarian vessels, artery, and vein, which cross it to descend into the pelvis along its outer border. At the brim of the pelvis on the right side the ureter lies just behind the peritoneum, where it can be seen with the ovarian vessels. The peritoneum can be incised at this point, and the ureter thus easily laid bare.

'On the left side the relations of the ureter to the sigmoid flexure and the rectum depend entirely upon the length of the meso-sigmoid and the variable position over the superior strait at which the rectum enters the pelvis. Thus in one case the ureter lies behind the sigmoid veins and arteries, and in another directly behind the intestine.

After crossing the psoas it crosses the common iliac artery obliquely above its bifurcation, dropping into the pelvis at this point. The pelvic portion of the ureter usually lies at first to the inner side of the internal iliac artery; occasionally it lies to the outside; it is again crossed by the ovarian vein and artery, which leave it at an acute angle just above the brim of the pelvis (the brim was made by the muscle, and not the bony pelvis). The pelvic portion of the ureter descends to the floor of the pelvis in the loose cellular tissue in a forward direction; it passes directly under the uterine artery and the base of the broad ligament, alongside the upper lateral vaginal wall, and finally curves in over the anterior vaginal wall, following its uppermost converging folds, and terminates in the bladder, where the two urethral orifices are connected by the inter-ureteric ligament.

The ureter can be palpated through the anterior vaginal wall from its terminus in the bladder up to the point where it passes beneath the broad ligament. It is rolled in the loose cellular tissue under the index-finger, or often better bimanually under two fingers, or in advanced pregnancy on the

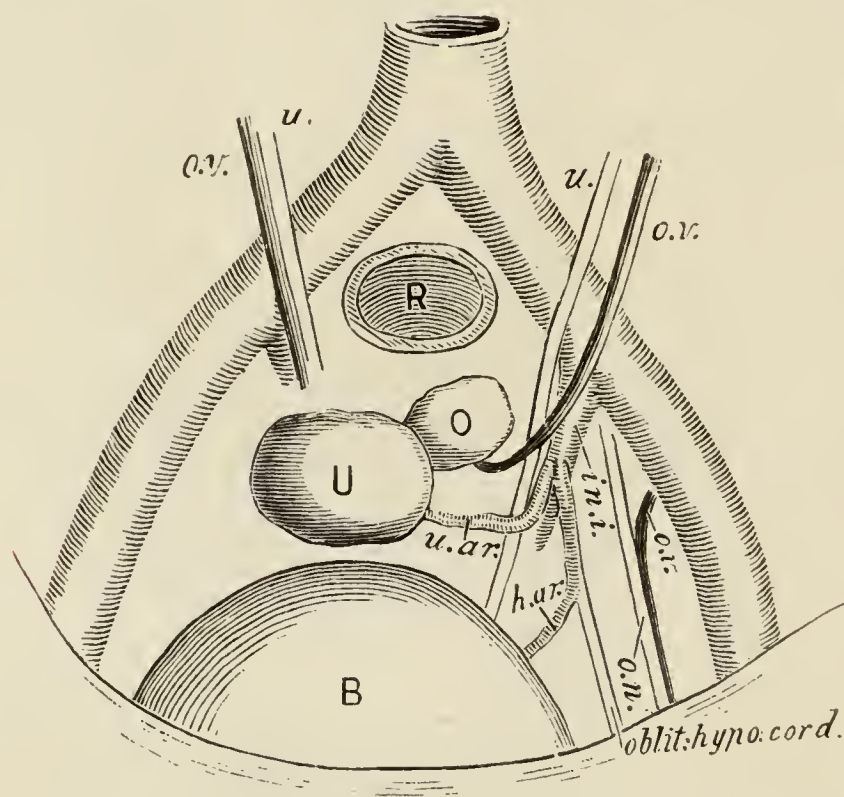


FIG. 26.—PELVIC PORTION OF URETER FROM BELOW.

u., ureter; *o.v.*, ovarian vein; **R**, rectum; **O**, ovary; **U**, uterus; **B**, bladder;
u.ar., uterine artery; *o.n.*, ovarian nerve.

head of the child like a narrow tape or flattened cord, without hardness. It must not be mistaken in this position for the obturator artery or nerve, or the upper border of the levator ani, or fibres of the obturator muscle, or the rim of the foramen.

A diseased ureter becomes nodular and thickened, and is peculiarly prone to be mistaken for a cellulitis or an adherent ovary. I have demonstrated this fact on numerous occasions for a number of years.

A large percentage of cases under treatment to-day for cystitis and for irritable bladder are in reality tender thickened ureters, and an intelligent palpation will detect the tube now hard and cord-like, bringing out the

characteristic complaint of intense desire to urinate. One patient in whom I persisted in making the examination was actually forced to urinate on my hand.

‘An enlarged ureter can easily be further palpated per rectum behind the broad ligament, and followed from there up over the posterior pelvic wall, as I was also able to demonstrate on a case in the hospital.

‘I have found that *the normal ureter can also be traced and minutely examined in the upper part of the pelvic course by introducing a ureteral catheter through the urethra and bladder into the ureter, and carrying it up to or over the brim of the pelvis.* When an inflexible catheter is thus carried over the brim, the ureter is displaced upward and straightened out. It can now be palpated almost as plainly through the rectum, on the catheter, and

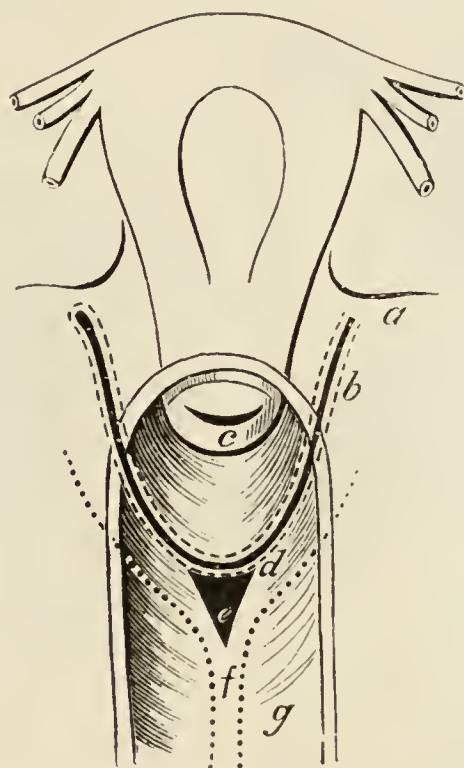


FIG. 27.—DIAGRAMMATIC FIGURE TO SHOW THE PORTION OF THE URETER ACCESSIBLE TO THE EXAMINING FINGER.

a, Base of round ligament; *b*, ureter and (*d*) intra-ureteral ligament; *c*, trigone; *f*, urethra; *g*, vagina.

any alterations in its calibre noted almost as minutely as when laid bare by dissection.

‘At the pelvic brim the ureter can also be felt per rectum.

‘It can be felt at the brim less distinctly through the anterior abdominal wall, where it can also be followed for 6 or 8 cm. up toward the kidney, while the catheter remains in place.

‘*My landmark for the upper portion of the pelvic ureter is the internal iliac artery, which can readily be felt per rectum.*

‘In some cases the artery can be palpated up to the common iliac artery. Close along the inside of this artery the ureter can be felt; if nothing is felt the conclusion that this portion of the ureter is not enlarged is safe.

‘Among the efforts made to locate the abdominal portion of the ureters by surface landmarks, I know none which have thus far proven satisfactory.

'My own method is to locate the promontory of the sacrum by pressure through the abdominal wall, and from this to locate the point at which the ureter enters the pelvis from 3 to 3½ cm., outside of, and a little below, the promontory. By pressing deeply at this point, the fingers at once recognize the pulsations of the common iliac artery, a sign that the correct spot has been found. A large ureter can be felt at this point through thin walls. The patient will always complain of severe pain, and often of a desire to urinate when a sensitive or inflamed ureter is touched.'

The symptoms due to a stone in the kidney in a young girl may be attributed to spinal disease, or to some uterine or ovarian affection. Nor does it infrequently occur that such pelvic disease

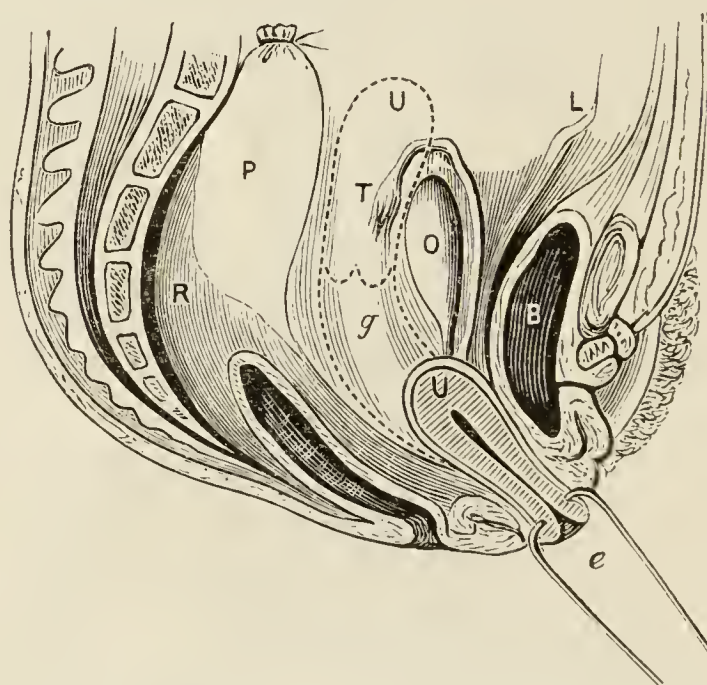


FIG. 28.—SHOWING THE DISTURBED RELATION OF PARTS WHEN THE UTERUS IS DRAWN DOWN. (GREIG SMITH—AFTER SAVAGE.)

R, rectum ; U, uterus ; B, bladder ; P, peritoneum ; T, Fallopian tube ;
O, ovary.

complicates the presence of a renal calculus. The various operations of hysterectomy demand an intimate knowledge of the relation of the bladder and ureters to the uterus and its appendages. I have thought it desirable thus to insist on the advantage it will be to the student of anatomy to take every opportunity of studying all these relationships, and noting any abnormalities of these viscera or in their vascular supply.

CHAPTER II.

FIRST STEPS OF EXAMINATION OF A CASE.

As in the case of other organs, that physician is most likely to arrive at a sound basis for his treatment of the uterus who makes his *first* examination a systematic and careful one. Many an error in diagnosis might be saved if we adhered to this rule. One word of caution is needful. While unnecessary examinations of the uterus are, above all things, to be deprecated, on the other hand nothing can be more dangerous to a medical man's reputation than the neglect of making a careful vaginal examination, when he is in doubt as regards the nature of a difficult case, with symptoms clearly pointing to some affection of the pelvic viscera. Want of caution in this respect has brought many a young medical man into disgrace. Take, for example, hæmorrhage, or dysmenorrhœa, the result of undetected uterine polypus; a discharge associated with some pelvic suppurative state; irritability of the bladder, due to a displacement of the womb, a pelvic hæmatocele, or a uterine fibroid; some difficulty in defæcation, attendant on a tumour, pelvic effusion, or uterine displacement; frequency in making water, due to undetected stone in the bladder; a prolonged back-pain, the result of retroversion of the uterus. *The most serious oversight of all is the non-discovery of malignant disease.* This I have known to occur on several occasions. There is no retreat from the unpleasant position in which such an oversight places the medical adviser. These are just a few instances of the many cases in which the want of a careful vaginal examination, in the first place, is certain to reflect discredit, through some undiscovered morbid or abnormal condition of bowel, uterus, or bladder.

The appliances necessary to make a *first* examination, in the great majority of cases, are,—

For preliminary examination :—

Bed or couch.	Stethoscope or phonendoscope.
Tape-measure.	Specula.

Uterine sound.	Clinical thermometer.
Catheter.	Absorbent wool.
Speculum forceps.	Urinary tests.
(Oliver's papers and Pavy's pellets are convenient.)	

For further examination :—

Bartlett's aspirating needle.	Uterine hook or tenaculum.
Laminaria antiseptic sponge-tents.	A general anæsthetic.
Uterine dilators.	Cocaine.

The final appeal must be made to the microscope, and the pathological and bacteriological laboratory.

History of the Case.—We first take the history of the case somewhat in this form :—

Age ; occupation ; married or single ; number of pregnancies ; number of abortions ; date of last pregnancy or miscarriage ; if nursing ; age at which menstruation began ; dates of last three periods ; character, quantity, quality, regularity of the flow, and if associated with pain ; if there be pain, its nature and seat ; discharges, whether inflammatory, leucorrhœal, sanguineous ; hereditary tendencies in the family history ; state of the bowel ; sleep ; appetite ; exercise (power of walking). It may be well to make a few brief observations on each of the facts thus elicited at our first interview.

Age.—The age of the patient has an important bearing on the diagnosis and management. Take, for example, the time of *puberty*, with the physiological influences associated with the commencement of the function of ovulation, and the various disturbances, physical and mental, of commencing adolescence. There is the equally critical period of life, the *menopause*, when the active discharge of the function of ovulation is ceasing, and the child-bearing epoch is about to end.

At this period, also, we are likely to meet with vicarious hæmorrhage, epistaxis, hæmatemesis, hæmoptysis, retinal hæmorrhages, hæmaturia.

The question of there being any such thing as *vicarious hæmorrhage* was raised by Wilks.* For my part, I have not the least doubt of its occurrence. I have had several cases in which it was present, as a consequence of suppression of menstruation, or during the commencing irregularity of the catamenia at the menopause. I have seen it in the form of epistaxis, hæmatemesis, and hæmoptysis.

* See Robert Barnes's paper, British Gynæcological Society, April, 1886.

One lady I attended for some years, and whenever the catamenia were suppressed for a few periods, she had violent hæmoptysis, alarming to herself and friends. This quite ceased with the end of the climacteric, and she remained in perfect health for years. The hæmoptysis generally lasted for two or three days, and was always checked by a mixture of gallic acid, matico, ergot, and digitalis. Before the hæmorrhage, she suffered from fulness in the head and shortness of breath. She was otherwise a robust woman and in good health.*

Esthiomenic Menstrual Ulcer of the Nose.

A young lady, aged twenty-six, was attacked with a small ulcer on the inner side of the cartilage of the nose. This resisted various forms of treatment, assuming a tubercular or lupoid character. At each menstrual epoch redness and pain supervened, the ulcer becoming very irritable, and ultimately taking the form of a malignant ulcer, with a hard, dark-coloured and depressed slough, with raised edges and inflamed circumference, threatening the nose with destruction, and involving the lip at each side. The agony the patient suffered at each menstrual period was great. No treatment arrested the extension of the slough save complete extirpation with the knife, and the application of nitric acid or chloride of zinc paste to prevent its recurrence. Seventeen such operations had to be performed before the nose was ultimately cured. Only the slightest deformity, however, remains. The portions removed were several times subjected to bacteriological examination, but nothing definite could be discovered. The ulceration spread from one nostril to another, at one time reducing the skin of the column to the thickness of about two lines, and extending at either side to the lip. There was no doubt of the esthiomenic nature of the ulcer and its malignant tendency, or of its association with menstruation.†

During the climacteric, women may be troubled with various head troubles, flushings, pain, migraine, and other important disturbances of the nervous system, as convulsions or paralysis. Climacteric insanity manifests itself in taciturnity, melancholia, with or without delusions, and hypochondriasis. The patient has the conviction that she is guilty of some unpardonable sin against her husband or family. Suicidal mimicry may be present, or true suicidal impulses. Such attacks of depression or exaltation may be absent or greatly lessened in the intervals between the menstrual periods, and at these epochs the fits may come on or be accentuated. All such cases during the climacteric require exceptional watching and care. They are typically cases for nursing and supervision in a

* See chapter on Menstrual Disorders for remarks on *Pigmentation during Menstruation*.

† A full report of this unique and interesting case will be found in the *Edinburgh Journal of Medical Science*, 1898.

medical home, and, save in rare instances, they are not to be treated as insane women. A very large proportion recover when the climacteric has passed.*

There is the intervening period of active ovulation, during which —*the child-bearing period*—the woman is liable to any of the accidents or results that follow from deviations from the normal physiological act. It is during these years that we have to deal with disorders of menstruation, as amenorrhœa, dysmenorrhœa, menorrhagia, leucorrhœal discharges; ovarian troubles, as ovaritis; ovarian morbid growths, ovarian solid and cystic tumours; uterine congestions, inflammations, growths, alterations in position, flexions and versions, and all the results of these abnormal conditions. If the woman be married, we meet with those affections which are often directly or indirectly connected with the married state: vulvar and vaginal inflammation, uterine discharges, specific sores and gonorrhœa, perinæal laceration, hæmorrhoids, vesical and urethral complications, ectopic gestation, pelvic inflammation and adnexal tumours. Both in the single and married woman, malignant or non-malignant growths are more apt to occur, and in the married the various disorders consequent on lactation.

Pregnancies and Abortions.—The number of pregnancies with their successive effects on the constitution of the woman and the uterus, is a point of considerable moment. The history of lacerations of the cervix, subinvolution, fistulæ, vesical troubles, or mammary growths, should be traced. The relation of fibroids to the pregnant condition may be ascertained. Repeated abortions and miscarriages lead us to suspect either a habit, or the presence of syphilitic taint, as cause. They may explain some accompanying constitutional fault, and arouse our suspicion of latent renal mischief, and on examination of the urine we detect albuminuria or the evidence of granular kidney. Inquiry into the possibility of a specific taint is assisted by putting cautious questions concerning the living and dead children, the dates of the abortions, and the various periods of pregnancy at which they took place. Most important of all contingencies for the practitioner to keep in view is that of ectopic gestation and its consequences.

Occupation and Habits.—This inquiry should follow that into the patient's age: whether she leads an active or sedentary life; if she has to stand much, or to do a great deal of stooping work; if she sits up late at night, dissipates, or spends a considerable

* See chapters on uterine reflexes and sexual correlations.

time at the piano, painting, or the sewing-machine; in short, how she generally occupies and amuses herself. This inquiry naturally touches on her daily habits—exercise, clothing, diet, and bathing. We may question her or her friends as to the outdoor exercise taken daily; elicit information on such important matters as tight lacing, tight garters, the manner of suspending the under-clothing, the wearing of flannel, and if the temperature of the extremities be attended to. We learn the nature of her food—if healthful, simple, and nutritious, or trashy and indigestible; the times of meals, and the intervals between; the quantity of alcohol and tea consumed, the hours of rest, and the amount of sleep. Not the least important matter to elicit is, the care bestowed on the skin. The resort to a daily bath, suited in its degree of temperature to the temperament of the individual, is perhaps the most healthful custom a woman can adopt.

Every woman should have a sponge-bath in her bedroom. If she cannot take the cold bath, she can regulate the temperature of the water, according to the time of year, from 60° upwards, and have proper sponging of the body, followed by friction with a rough towel. Sea-bathing, again, is most bracing and suitable for many constitutions. It is quite as unfit and hurtful to others. It is well to find out exactly how the sea-air and sea-bathing affect individuals before we either permit or recommend it.

Sea air has a special effect on menstruation in some women. I have had several cases in which irregularity occurred as a consequence of change to the seaside and sea-bathing. As a rule, a bracing climate and mountain air are to be preferred in cases of erratic or suppressed catamenia.

Menstruation.*—With young girls we frequently find a difficulty in coming to any definite conclusions regarding the regularity, the quantity, and the quality of the menstrual flow—all of them equally important facts. At times we are wilfully deceived, and this must always be remembered in cases in which the least suspicion of pregnancy exists. Here we must place little reliance on assertions, and ascertain, if possible through a mother or relative, if the patient has menstruated regularly. Mothers are at times careless in watching the occurrences of menstruation; this important duty is left to governesses, schoolmistresses and servants. Hence, not seldom does it happen that a girl is brought for advice for some anæmic or chlorotic state, and the irregularity of menstruation associated with it has passed unnoticed and unchecked. It is

* See preceding chapter for the various views on the function of the ovary and the relation of ovulation to menstruation.

necessary, in such instances, that we should insist on a careful watch being kept on the periods and the character of the discharge. If there be suffering with the period, we must learn the time when the pain is most severe ; if it precede the flow, and disappear or continue during its occurrence ; if there be nervous disturbances, headaches, symptoms of cerebral congestion or hysterical tendencies. Tinnitus aurium or visual aberrations may guide us to an ophthalmoscopic examination, and the discovery of arterial tension, optic neuritis, hyperæmia of the retina, or an error of refraction. Abnormal retinal states will suggest a urinary examination, and possibly the detection of some latent renal disorder. It will be important to date accurately the commencement of any irregularities, whether in diminution or excess ; also, if there be menorrhagia, to know whether any slight discharge continues in the intervals between the periods, and its quantity. If the patient has been regular and has ceased to be so, we look for some cause for the first irregularity, as indiscretion in exercise, in dress, in bathing ; perhaps in mental shock or emotion, or in climate, or in the period of life.

Discharges.—I shall have occasion more fully to refer to the diagnostic importance of uterine and vaginal discharges in another chapter. I may here briefly allude to the character of the discharge, which has to be ascertained at the first examination. It may be in nature mucoid, purulent, muco-purulent, sebaceous, sanguineous ; it is described as creamy, flaky, thick and viscid, gelatinous, transparent, or acid ; in colour, grayish, white, yellow, or brown ; at times it is tinged with blood, or it may be of an olive-colour ; it may have a very heavy odour or be extremely fœtid. All these qualities indicate, more or less, the source and nature of the discharge. Our opinion is fortified or verified by a microscopic examination, when the presence of pus and the kind of epithelium, whether squamous or columnar, can be determined.

Appliances necessary for Diagnosis.—It is necessary to refer to the objects gained by the use of the appliances already alluded to as required in a careful diagnosis.

Bed or Couch.—In order to make a correct diagnosis we have to proceed as follows : The patient is either in bed or on a couch. For use in private I prefer the latter.

A good examining couch should be constructed so as to raise readily the hips of the patient. The complicated and ingenious mechanisms which are advertised are quite unnecessary. All we require is a couch or table of convenient height and breadth, one, over the end of which the buttocks can be

conveniently drawn, and the thighs supported in rests that are attached to it. In a private consulting room the less obtrusive or conspicuous a couch is the

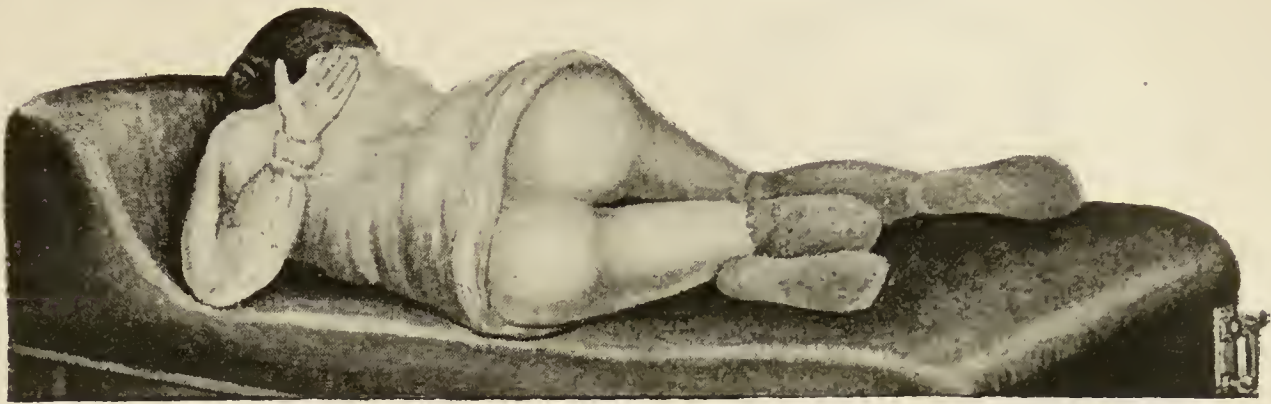


FIG. 29.—PATIENT IN SIMS' SEMI-PRONE POSITION ON COUCH.

better. For private practice a light couch (Figs. 29 and 30) can be constructed, with a drawer at the end for appliances. It should be conveniently high for the woman to get on to without any difficulty, and for the operator to sit at the side or end of to conduct any necessary manipulations. A light rug or wrap should be at hand to cover the extremities, and the majority of examinations can be conducted with little, if any, exposure of the patient. The couch should have an incline from the foot to the shoulders of 5 inches, and the top can be sloped upwards to nearly the same level as the foot. It is a good plan to have a light stand for appliances, made the same height as the couch, opposite the operator's chair, and another chair at the left-hand side at its head, on which a friend can sit. She can thus be cheered and encouraged, while her delicacy is not hurt.

It is wonderful how a little gentleness and consideration, with a due regard to a woman's feelings, especially in unmarried girls, will enable us to conduct an examination which any roughness or rudeness would make impossible. We can place a woman on her left side, on her back, or in the semi-prone position of Marion Sims. It is im-

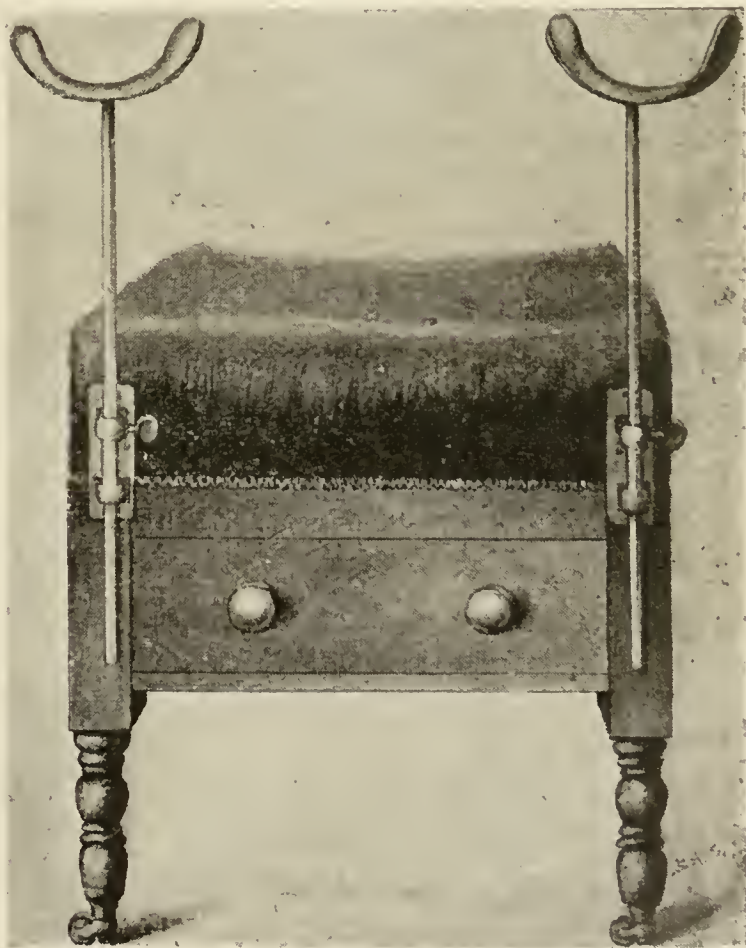


FIG. 30.—END OF COUCH, WITH THE LEG-RESTS ADJUSTED.

possible to get the last-named posture properly in any ordinary

bed, yet it is undoubtedly indispensable in several manipulations of the uterus. For the majority of first examinations, it is

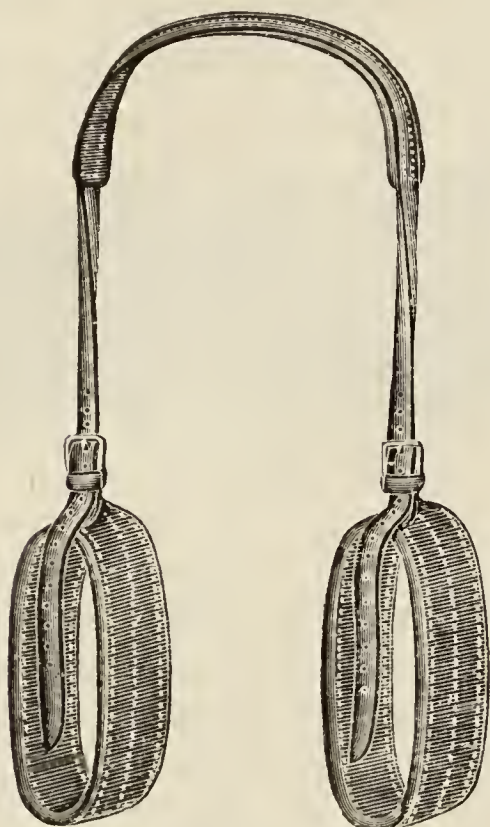


FIG. 31.—LEG SUPPORT.

The thigh-rests are attached to the strap by buckles—one end of the strap being brought under the left axilla.

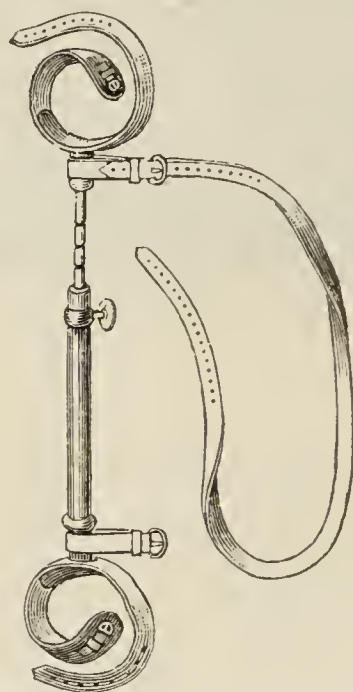


FIG. 32.—CRUTCH OF VON OTT (ST. PETERSBURG).

The long strap fixes the patient to the couch or table.

sufficient to place the woman on her left side, her thighs drawn

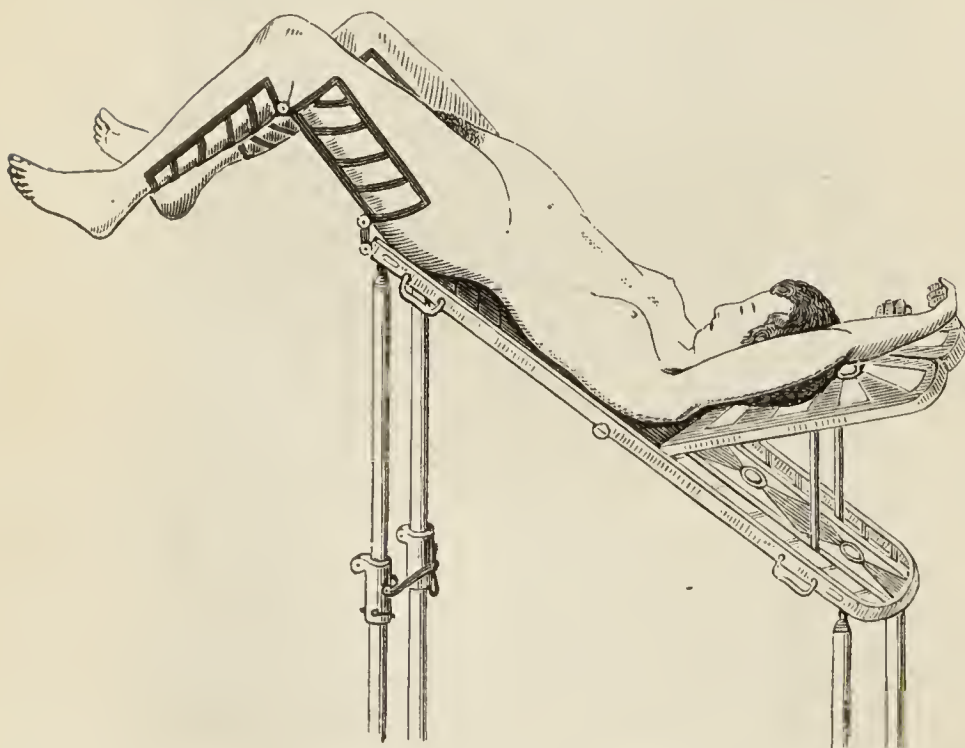


FIG. 33.—PORTABLE TABLE FOR TRENDLENBURG'S POSITION.

up to the abdomen (if in bed, the body should be placed diagonally), with the buttocks brought to the edge and the left arm carried behind the back, the face resting on the pillow. It is best to examine on a hard mattress, and, if required, a few pillows may be placed under the hips to raise them. The couch or table must be opposite a good light. After a first examina-

tion, and when further exploration of the uterus and adnexa is

necessary, or the duckbill speculum is employed, the dorsal position and bimanual method is by far the best. The bimanual examination is absolutely necessary in every thorough exploration of the uterus

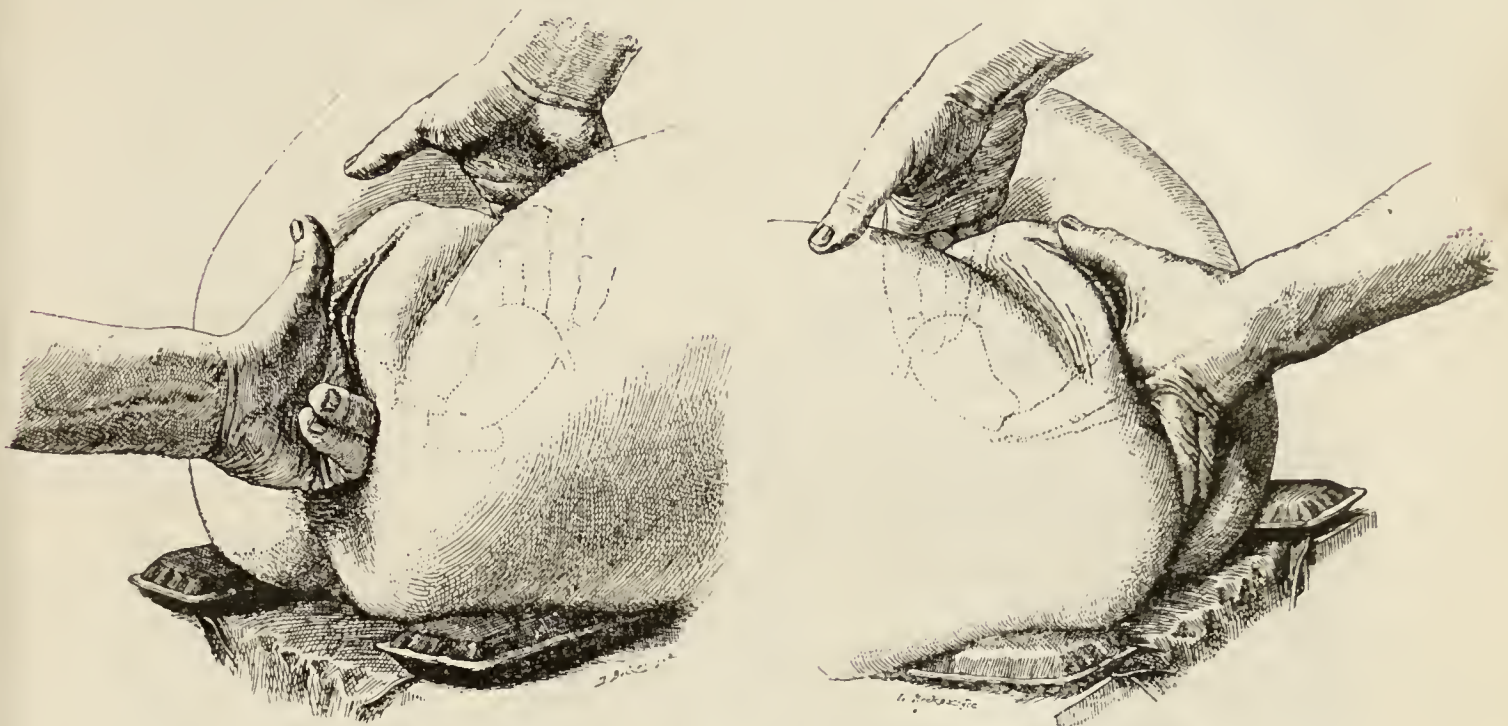


FIG. 34.—BIMANUAL EXAMINATION, FROM HOWARD KELLY, SHOWING THE DIFFERENT POSITIONS OF THE HANDS AND FINGERS.

and pelvic viscera when a complete diagnosis of a tumour, whether of the uterus or adnexa, has to be made. By its means alone can we satisfactorily determine the size, mobility, and relation of the uterus. By this method we have more complete command over the

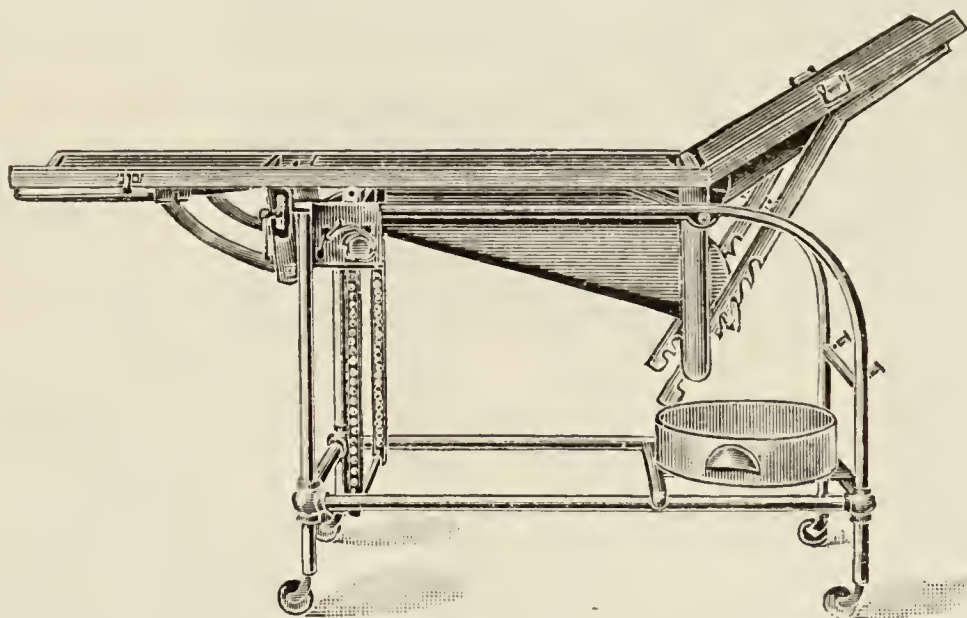


FIG. 35.—EXCELLENT OPERATING TABLE, NICKEL AND GLASS, SUITABLE FOR ALL ABDOMINAL OPERATIONS.*

adnexa, and can best judge of alterations in their size, of adhesions, of the character of the enlargements both of the uterus and adnexa. It is *the* examination to make when the patient is under an anæsthetic.

* I usually operate upon this table, and can recommend it. (Messrs. Arnold.)

When we determine to adopt the semi-prone position we do so thus: Any square table about 4 feet by 2 feet 6 inches, having a blanket smoothly

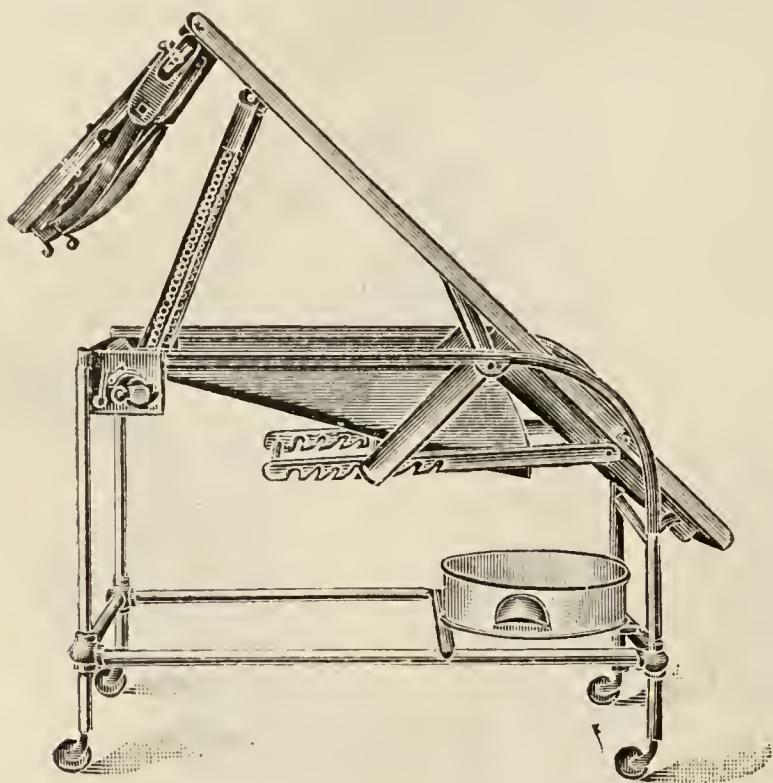


FIG. 36.—TABLE IN THE TRENDLENBURG POSITION.

spread on it, answers the purpose admirably. The patient lying down on this surface, on her left side, with the body placed diagonally, the buttocks well to the side, has the thighs drawn up; the left arm is next taken, and the back of the left hand is laid on her left scapula. The right hand is now allowed to hang over the side of the couch, while the face is, when possible, partly turned towards the operator. Thus the sternum and chest are brought well on to the plane surface. At times we may not be able to accomplish this, but we thus secure the most favourable depression of the sternum. An assistant or nurse to hold the speculum steady and in position—a little art in itself—is required.*

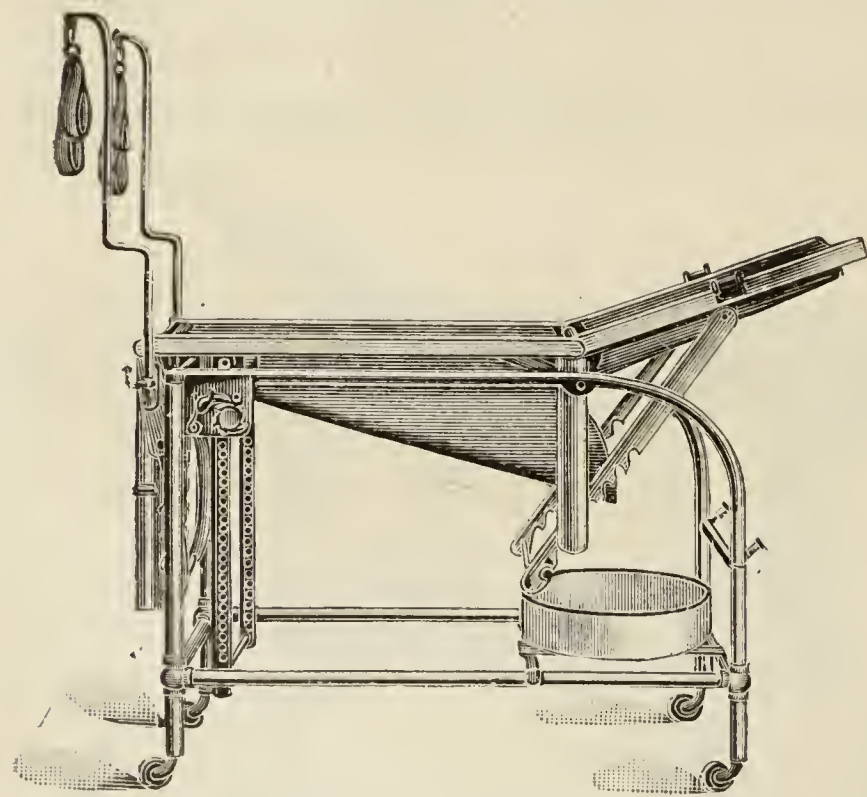


FIG. 37.—TABLE ADJUSTED FOR VAGINAL OPERATIONS.

classes, come for the purpose of securing abortion, the medical man cannot be too cautious. Women are most importunate and pertinacious in their

* For ordinary use in an examination under an anæsthetic Howard Kelly's leg-rest is most convenient.

spread on it, answers the purpose admirably. The patient lying down on this surface, on her left side, with the body placed diagonally, the buttocks well to the side, has the thighs drawn up; the left arm is next taken, and the back of the left hand is laid on her left scapula. The right hand is now allowed to hang over the side of the couch, while the face is, when possible, partly turned towards the operator. Thus the sternum and chest are brought well on to the plane surface. At times we may not be able to accomplish this, but we thus secure the most favourable depression of the sternum. An

Attendant in Study.

—So many serious charges have of late been made against medical men, that I deem it right to emphasize the caution given in the text, so that the practitioner may put it out of the power of any designing or hysterical woman to bring a charge of criminal assault against him by taking such precautions as will make this impossible. Also, in those equally serious cases in which women, more often those of the better

endeavours to effect this purpose. A medical man may be made the victim of a plot to throw the blame off the shoulders of another. A woman may wilfully deceive him as to the occurrence of the catamenia or of hæmorrhage, and the impossibility of conception. A false charge of effecting criminal abortion may be the consequence, and if the practitioner be not wary and determined, appearances and circumstances may be urged against him that he could never have anticipated. Circumspection and caution to a degree that may seem almost unnecessary are demanded in order to defeat either hysterical delusion or deliberate intrigue. The obligations of professional honour and fair play impose on all practitioners the need for the greatest care and reticence in listening to any such stories, when whispered of a brother professional. It is doubtful if so many such unfortunate cases would occur

save for the too ready ear of some medical man, who, either designedly or through incaution, has countenanced a groundless suspicion, or favoured a charge absolutely ruinous to the character of him against whom it is made. Such precautions are all the more necessary in these days, when women generally are so conversant with medical matters, and read the details of these cases in the daily press, or gather their information from medical literature, to which they have too free access. *In every case in which the prac-*

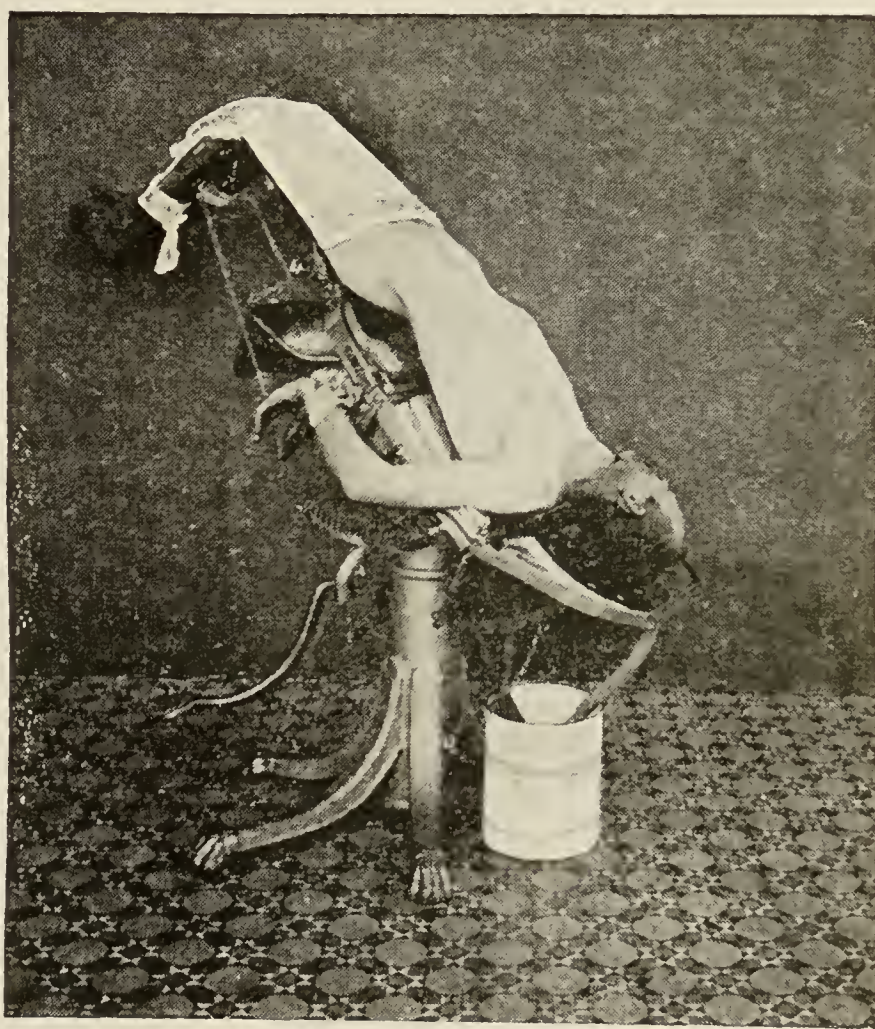


FIG. 38.—PATIENT ON THE TABLE OF DOYEN IN THE COMPLETE TRENDLENBURG'S POSITION.

titioner has the least suspicion as to the object of a woman's visit, or when she makes any illegal request, he should take a note in writing of her name, residence, time of coming to and leaving his room, the data on which he formed the opinion he gave, the advice that accompanied this opinion, and of any prescription he may have written.

The Tape-measure is useful for abdominal measurements. We may require to take the circumference at the umbilicus, and the lateral measurements from it to the spinal column, and from the umbilicus to the anterior superior iliac spine to the symphysis. We

thus estimate the amount of abdominal distension, and the size of a tumour, or the relative difference and degree of inequality between either side. The value of careful measurements is exemplified by the following case.

Anomalous Tumour of Ovary causing Lameness and Symptoms of Hip-joint Affection.

The plate (IV.) shows a solid ovarian tumour of an anomalous nature removed at the same time as a large fibro-myoma. The patient was sent for examination in consequence of an obscure affection of the left hip; there had been constant pain and swelling of the left thigh, with difficulty in walking.



FIG. 39.—MICROSCOPICAL APPEARANCES OF ANOMALOUS OVARIAN TUMOUR.
(*Vide* PLATES IV. AND V.)

The catamenia had been regular. There was no hæmorrhage. I determined that her symptoms were due to the pressure from the tumour. Intraperitoneal hysterectomy was performed.

PLATE V.



FIBRO-ADENOMA OF THE OVARY OCCURRING WITH A FIBROMYOMATOUS UTERUS.
(AUTHOR.)

Abdominal Salpingo-Oöphorectomy.



TO SHOW LOBULATED EXTERNAL SURFACE OF THE TUMOUR.

[To face p. 62.]

PLATE VI.



FIBROMYOMATOUS UTERUS REMOVED FROM THE SAME PATIENT FROM WHOM
THE OVARY (PLATE V.) WAS TAKEN. RECOVERY. (AUTHOR.)

[*To face p. 63.*

The multiple fibromatous ovarian mass was then discovered on the left side. It was larger than an orange. This was jammed downwards and to the left side. The patient made a perfect recovery. The microscopical report of the committee of the Obstetrical Society was as follows: 'The tumour (part involved in the growth) consists chiefly of well-developed fibrous tissue arranged in intersecting bundles—sections taken from different parts show, in addition, numerous widely distributed well-defined spaces fitted with epithelial cells. These spaces are irregularly oval or elongated, occasionally branching, and there is no lumen. There is no sign of invasion of the surrounding fibrous tissue by the epithelial cells, and no small-celled infiltration. The stroma surrounding some of the spaces is dense and hyaline in appearance.' The decision arrived at was that the tumour was not malignant, and that in the arrangement of the epithelium it most nearly resembled that met with in some forms of adeno-fibroma of the breast.

The Stethoscope is required for the differential diagnosis of pregnancy from ovarian dropsy, ascites, fibrocyst and fibroid tumours of the uterus, phantom pregnancy, and other causes of abdominal enlargement. It is also required for pulsating tumours of the abdomen, and in the diagnosis of these from aneurismal enlargement of the vessels. The *phonendoscope* is of special value in abdominal auscultation.

The Tubular Speculum is employed to *see* the uterine cervix or the vaginal walls; in pathological states, as in erosion, lacerations, congestion, polypus, malignant growths and ulceration, and when a good view of the uterine cervix is necessary; also in inflammatory states of the vagina, or to detect fistula and growths. In virgins its employment is to be avoided whenever possible. Never should it be taken in the hand for introduction, in such cases, unless its assistance be indispensable for diagnosis or treatment.

The impression made on a patient by our first examination may secure her future confidence. Gentleness of manipulation must be cultivated, and especially in the use of any speculum. It is best to begin with a smaller-sized conical one. I prefer that with the rounded and bevelled end, as it does not hurt in the same way as those with a sharper edge.

Vulcanite specula are easily disinfected, and cannot be broken. The disadvantage of these specula is that the edges are rather sharp, and hurt in introduction; also, they do not reflect the light well. The short bivalve speculum of Barnes is a useful instrument. It completely exposes the intra-vaginal cervix. Fergusson's glass speculum (Fig. 47), of which we require three or four sizes, is generally made too long. The uterine end should not be sloped at too great an angle. It throws a good light on the os uteri,

and is useful for topical applications. It can be had of toughened glass. A fenestrated speculum is not, as a rule, of any special service.



FIG. 40.—METAL VULCANITE-COVERED DUCK-BILL SPECULUM. (LEITER.)

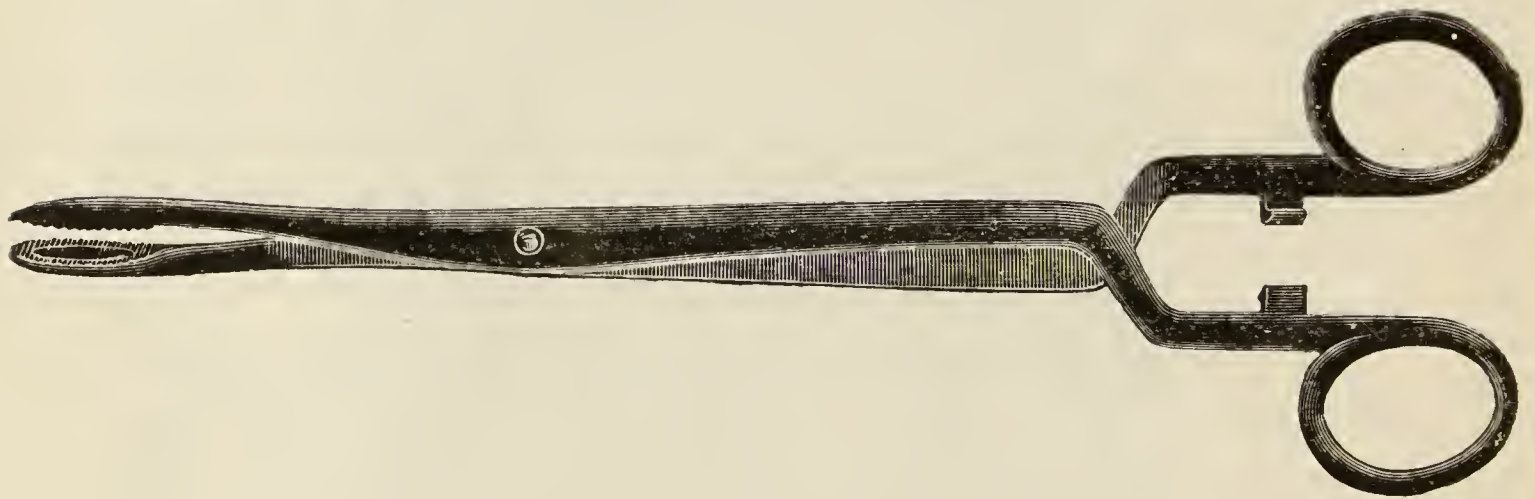


FIG. 41.—VULCANITE COATED SPECULUM AND DRESSING FORCEPS.
(LEITER.)

Most useful in vaginal operations in which antiseptics are employed, and in post-operative dressings.

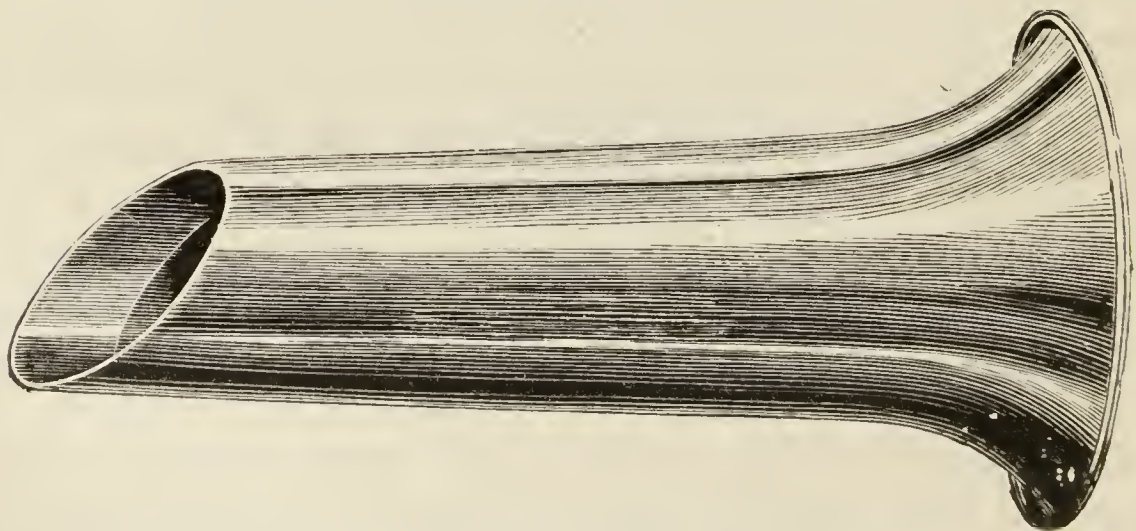


FIG. 42.—TAPERING SPECULUM OF AUTHOR WITH THE BEVELLED END SO CUSHIONED INTERNALLY AS TO PREVENT THE CONCEALMENT OF ANY SECRETION. Made of light metal, highly polished. It can be had in three sizes. It must not taper too much. (I have a full-sized *non-tapering* speculum of this kind, made for use in multipara.)

The duck-bill speculum (Figs. 40 and 45), or Neugebauer's (Fig. 46) variety of it, is used in the semi-prone or dorsal positions. It is indispensable to the gynæcologist in manipulations on the os uteri and cervix. In fact, in all cases in which it is possible to employ the duck-bill speculum it is better to do so.

Specula must be kept scrupulously clean, not alone for the sake of better illumination, but also to avoid the risk of any contagion in the examination of several cases with the same instrument. Metal duck-bill specula are made by Leiter (Vienna) coated with vulcanite; these can be thrown into mercuric chloride solution without detriment. It is well to place all specula in some disinfectant fluid after they have been used, and before they are finally washed with very hot water.

To apply a tubular speculum: place the patient on her back, or on her left side, in the position before described. The speculum is first well anointed with a disinfectant cream. If the lateral position be chosen, the right buttock is raised with the palm of the left hand, and the fingers of the same hand are used to separate the



FIG. 43.—SIMS' HOOK.

labia. The speculum, with the long lip posteriorly, is now pressed gently, but steadily, through the vulvar orifice. It is now pushed onwards, in a direction upwards and backwards, *bearing well on the perineum*, until we reach the posterior cul-de-sac of the vagina, and get the cervix well into the instrument. At times this is not easy;



FIG. 44.—SINGLE TENACULUM FORCEPS.

the uterus may be considerably anteverted or retroverted. A little practice and experience will enable us, with the uterine sound, to direct the os uteri forwards or backwards so as to bring it into sight. By rotating the speculum, withdrawing it a little and re-introducing it, we can generally obtain a complete view of the circumference of the cervix and the os uteri. The line of meeting

of the vaginal walls seen through the instrument should be kept in the centre of the surface exposed to view. If we place the woman on her back, we insert the speculum, and press it well back on the perineum in passing it into the vagina. In this manner the os



FIG. 45.—SIMS' DUCK-BILL SPECULUM.

The blades of the speculum should not be too deeply grooved, nor too long; those ordinarily made frequently are. Every practitioner should have two sizes of the duck-bill speculum.

uteri generally comes into view readily, and the patient can herself often give valuable assistance in supporting the speculum, if we happen not to have an assistant. The speculum forceps (Fig. 50) is

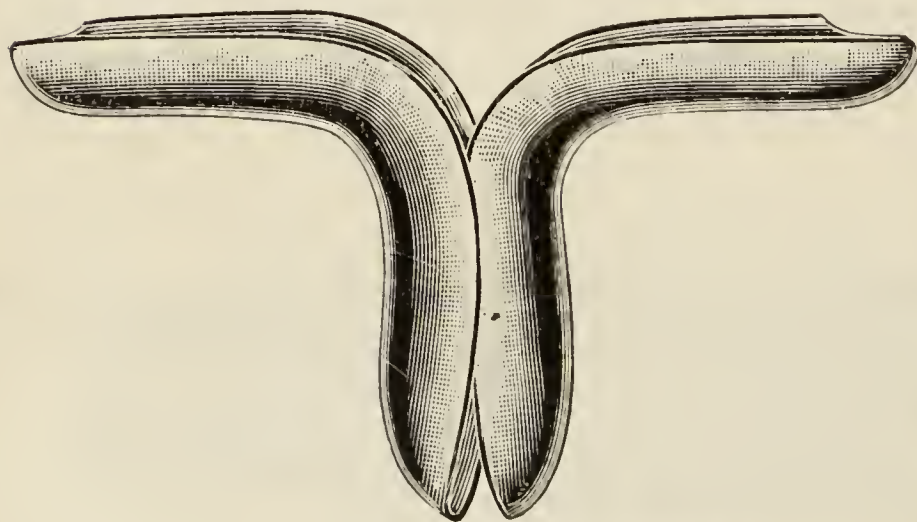


FIG. 46.—NEUGEBAUER'S SPECULUM.*

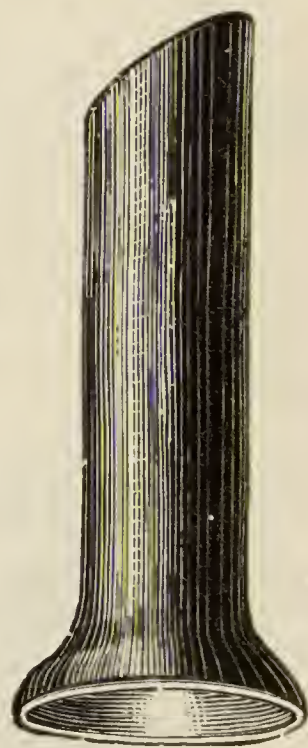


FIG. 47.—FERGUSSON'S SPECULUM.

required with the speculum, and some pledgets of absorbent cotton-wool ready at hand, to wipe the surface of the os uteri, and to clear the vaginal roof of any discharge that may have accumulated or be

* See chapter on Operations on the Vagina for the Various Retractors.

pressed out by the speculum. It is well to have a few uterine cotton-holders if we require to wipe out from the interior of the cervix any discharge with cotton-wool. To use the duck-bill speculum in the semi-prone position of Marion Sims, an assistant stands at the back of the patient and places the left hand flat on the right gluteal fold, holding it well up; the blade of the speculum

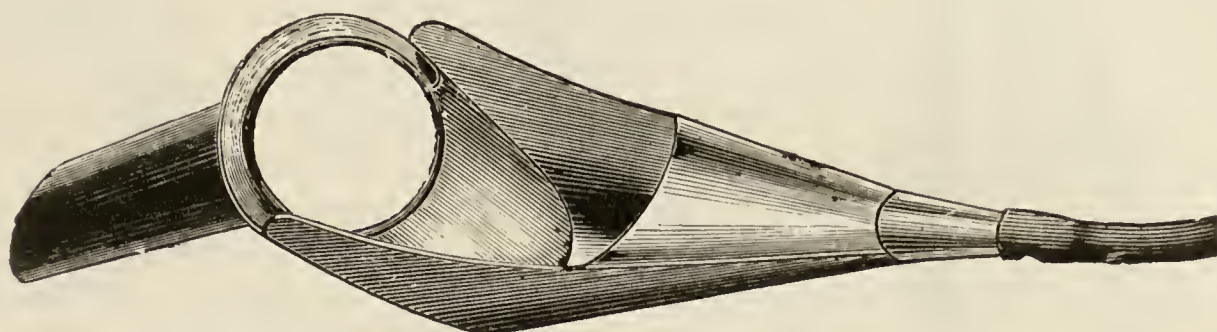


FIG. 48.—AUTHOR'S TUBULAR SPECULUM SLICE.

Useful in irrigation of the vagina.

is now introduced in rather an oblique manner to the orifice, the labia being gently separated; and while it is pushed upwards and backwards it is rotated on its axis, and the back of the speculum is brought against the perineum. It is then carried into position, directed by the finger. It will be found that more room is obtained,

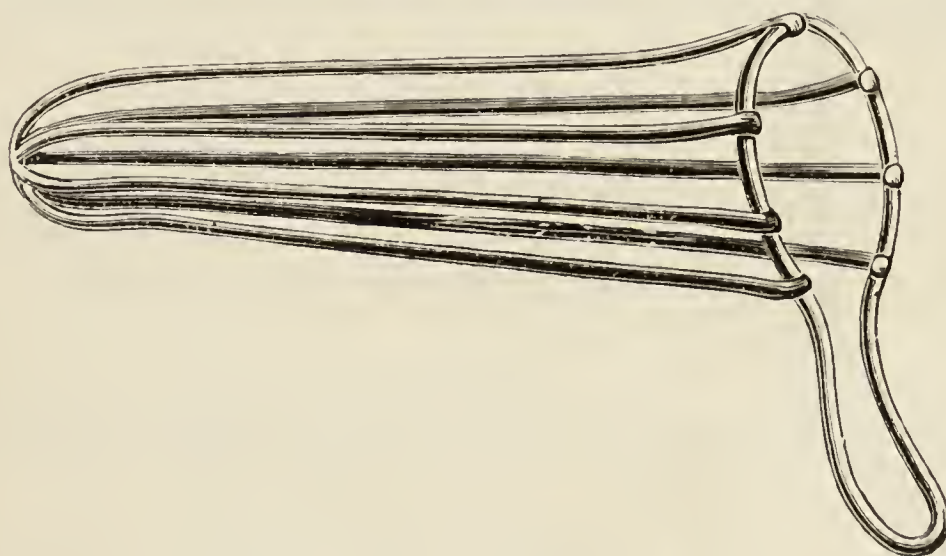


FIG. 49.—BATH SPECULUM.

and the uterus is better seen and more readily controlled, in the dorsal position. Once the speculum is properly adjusted, and the cervix uteri is brought well in front of the blade, the finger of the right hand, or the handle of the sound, must be carried up to the anterior vaginal wall, which is thus held out of the way. The

Speculum with Electric Illumination.—Various specula fitted with the electric light have been devised. Furst has devised a self-retaining speculum, to which a self-retaining electric light is attached. They can be obtained of any medical electrician. There is a good deal of the electric toy in these specula.

uterus is generally, by this method, well exposed to view. If we require to bring it down for medication, or to steady it for topical application, we use a Sims' uterine hook, or, what I prefer, a slender double tenaculum forceps. It is fixed in the anterior lip of the uterus, and the os uteri is thus drawn into view.

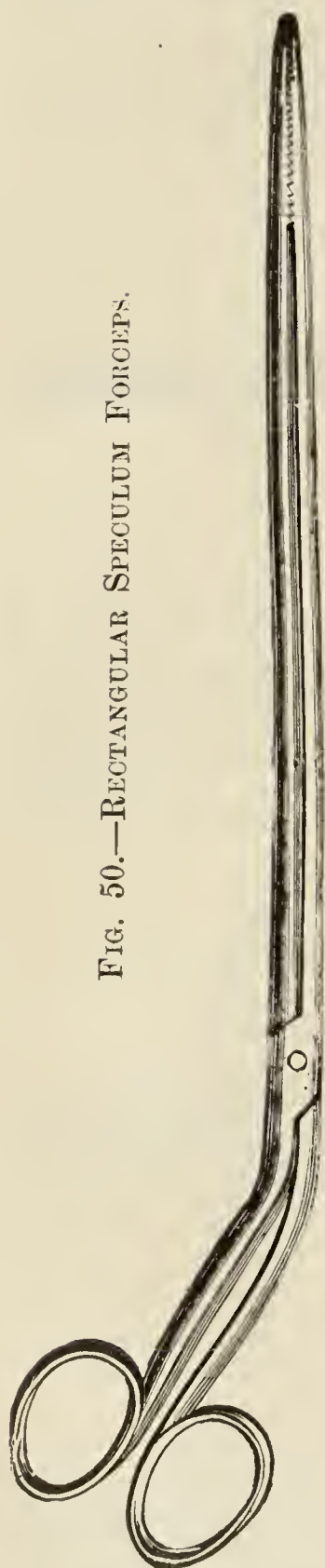


FIG. 50.—RECTANGULAR SPECULUM FORCEPS.

Neugebauer's speculum (Fig. 46), a modification of Sims', has in some instances the advantage, through its double blade, that it enables the operator to draw up the anterior vaginal wall. When applied it acts like a bivalve speculum, and is to an extent self-retaining. The posterior blade having been adjusted, the anterior is slipped within it, and is so guided into position. The vaginal roof is thus stretched, and a good view of the uterus is obtained. There are other modifications of Neugebauer's speculum which it is not necessary to refer to.

Demonstrating Vaginal Speculum.—The desirability of having such a portable speculum as would enable the surgeon to demonstrate to a student, at the bedside, the os uteri and infra-vaginal cervix, without exposure of the patient, often struck me in hospital work. By such an appliance as that shown in Fig. 51, this can be perfectly achieved. It consists of a nickel-plated steel bracket with three joints, as shown in the figure, which are so constructed as to enable the mirror to be placed at any angle or plane to the orifice of the speculum, from which it is 25 centimetres distant. A clamped ring with a groove receives the mouth of the speculum, and will fit one of large size. This may be so arranged that any ring can be applied so as to embrace a smaller speculum. At the other end of the bracket is a mirror, which works in a universal joint. It is 3 inches in diameter. If it be wished to get a magnified image, a slightly concave mirror can be attached.

The os uteri can be seen at a distance either by sunlight or artificial light, without exposure of the patient.

The Uterine Sound (Figs. 53–55) takes the place of a long obstetric finger. The more the practitioner's experience is enlarged by careful digital examinations of the vagina, uterus, and the adnexa, the less he will feel the need for the sound. Most conditions can be accurately and satisfactorily ascertained without it. *The bimanual method, aided, if need be, by the recto-vaginal, carried*

out in both the dorsal and semi-prone positions, seldom leaves us in doubt as to the size, and mobility, and hardness of the uterus, the state of the adnexa, and condition of the cervix and os. A good uterine sound

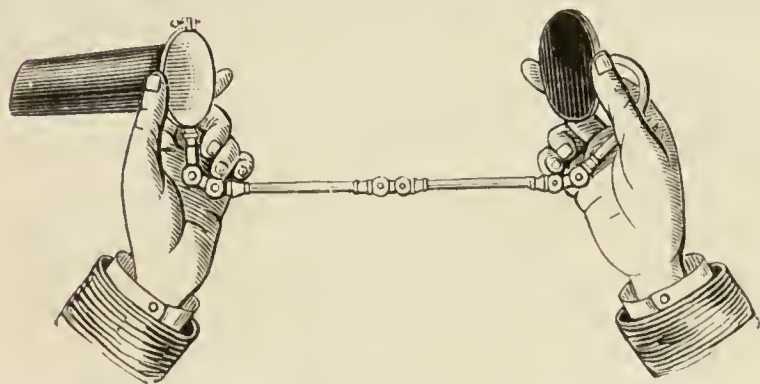


FIG. 51.—DEMONSTRATION SPECULUM OF AUTHOR.

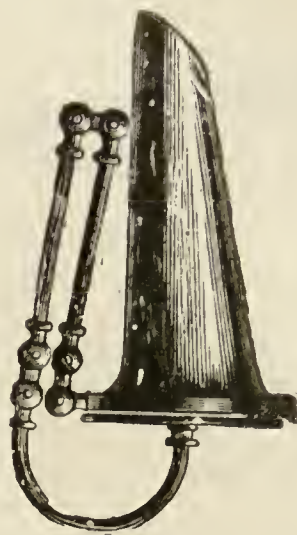


FIG. 52.—APPLIANCE FOLDED ($\frac{1}{4}$ SIZE).

should be pliable and smooth, and if graduated it is better to have the scale on the concave side. It can be made portable for the pocket, either by a screw joint in the centre, or the

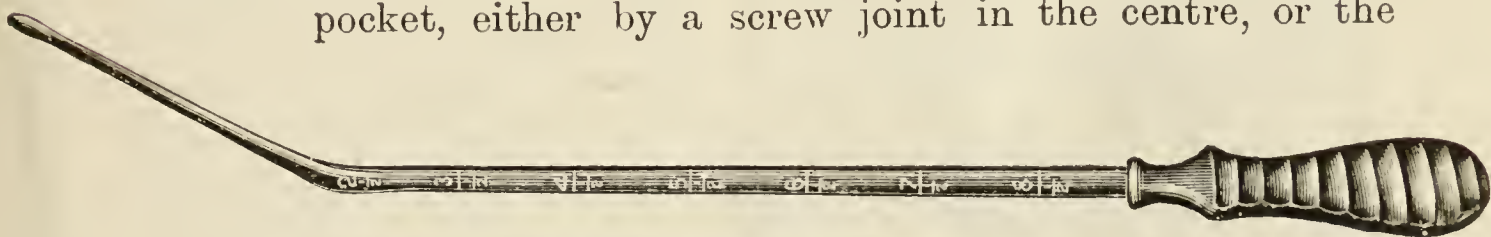


FIG. 53.—SIMPSON'S SOUND.

upper half of the instrument may screw into a case which acts as a handle. It should not be too heavy. The sound is used both for diagnostic and therapeutical purposes; in diagnosis,

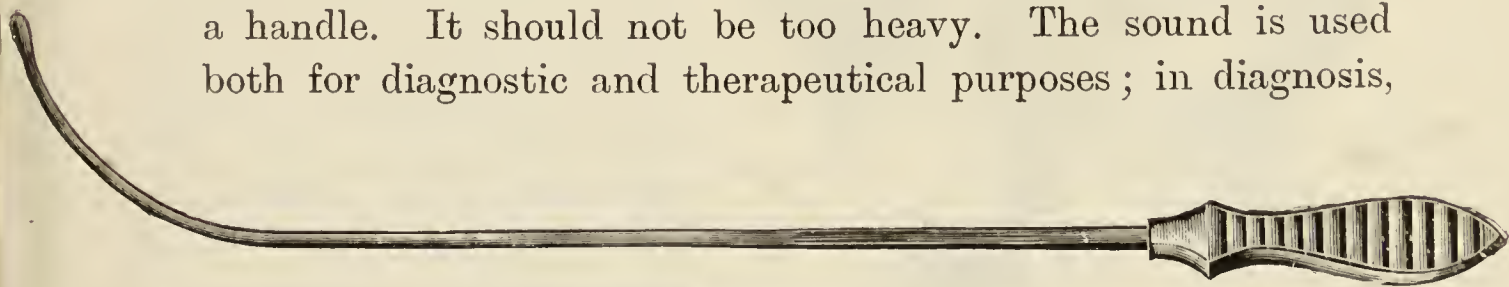


FIG. 54.—SIMS' PLIABLE PROBE.

to ascertain the length of the uterine cavity and the patency



FIG. 55.—AUTHOR'S SMALL PORTABLE SOUND, WITH CENTRAL SCREW.

of the canal, the mobility of the uterus and its position in the

pelvis; it is used in utero-rectal and recto-vesical examinations, as in the diagnosis of hæmatocele, polypus, and inversion of the uterus.



FIG. 56.—AUTHOR'S COMBINATION OF ELEVATOR AND SOUND
(MESSRS. ARNOLD.)

The cupped ivory end screws on to the silver shank. The handle is of aluminium. It is grooved and notched so that it can be covered with chamois or a layer of cotton wool if used through the rectum in the retroversion of pregnancy. It makes an admirable and well-balanced sound.

The principal therapeutical purpose of the sound is in versions and flexions, to take the place of a repositor. To introduce it into the uterus, we proceed thus:—

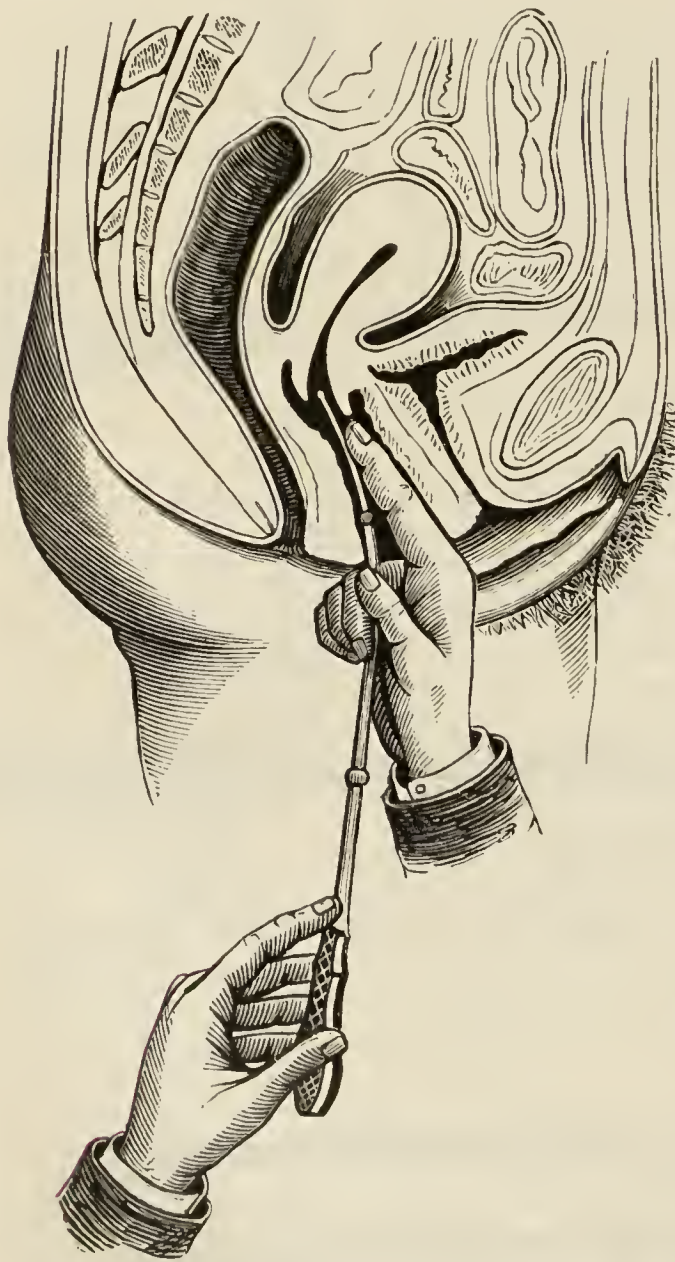


FIG. 57.—FIRST STAGE OF PASSING THE
SOUND. (HART AND BARBOUR.)

The patient is placed in the lateral or semi-prone position. The thighs are well drawn up, while the nates are brought over the edge of the couch. The instrument is taken lightly by the handle in the left hand, while the point of the forefinger of the right hand is carried up to the os uteri, which is felt, and its direction and the position of the uterus fairly ascertained. The sound is now introduced into the vagina, with the concavity towards the perineum and the handle directed backwards; it is next guided along the index-finger of the right hand to the os uteri. As a rule, with some little manipulation it enters the cavity of the cervix; it is then carried along the cervical canal, and now the handle is turned in the operator's hand,

and by a *tour de maître* is brought round with a gentle sweep,

until it is directed towards the perineum, so as to have the concavity now facing anteriorly, and thus the instrument is directed into the uterine axis in its normal and slightly anteverted position. It is now carried onwards, passing over the forefinger of the right hand, still held in position, until it reaches the fundus uteri. This we judge it to have done by the slight sense of resistance we feel to the onward passage. We should not make the woman's sense of pain a test. In certain softened states of the uterine tissues it would be possible to penetrate the uterine wall and still cause very little pain.

The usual difficulties experienced in passing the sound are caused by contraction, or stenosis of the canal of the isthmus uteri, or flexions, or versions. There may be such a degree of narrowing that it is impossible to pass the instrument, or we may only succeed with the pliable silver uterine probe of Sims. In versions we must carry the handle well back to the perineum, or forwards to the pubes, according as we have an anteversion or a retroversion to deal with; if there be also a flexion, we may have to bend the sound, and endeavour, by giving it the necessary curve, to glide it over the bend. We pass the sound into the bladder in recto-vesical and urethro-vaginal methods of examination. We must always remember the *sine quâ non* of obstetric practice—that before taking the uterine sound into our hand for any therapeutical or diagnostic purposes, we exclude the possibility of pregnancy.* Also, it is well, after all tedious examinations with it, if these be made at the operator's house, to take every precaution against cold; and the simplest plan to prevent this is to place a dry plug of absorbent wool in the vagina, to be withdrawn by the patient herself after a few hours. In this, as in a number of other trifling uterine operations, the immunity from all harm that may have followed us for years may be suddenly and unpleasantly interrupted when we least expect it—the attack of uterine colic or of endometritis, or perimetritis, is suddenly developed, and alarming symptoms

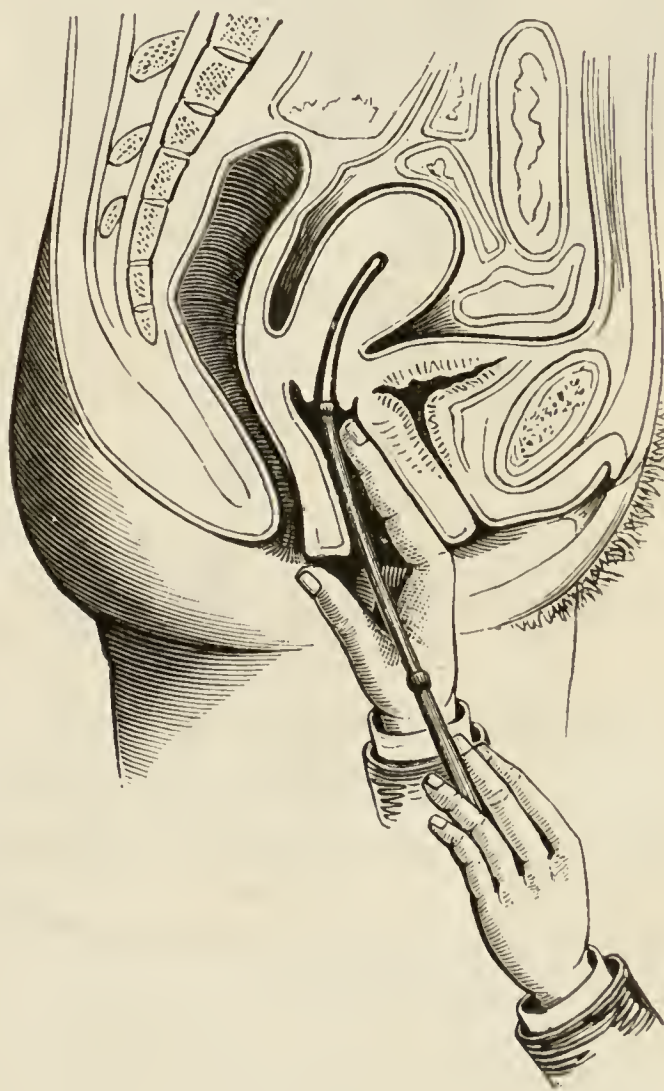


FIG. 58.—SECOND STAGE OF PASSING SOUND. (HART AND BARBOUR.)

* See remarks on the *differential diagnosis of pregnancy*.

may occur that a little prudent forethought would have prevented. Take, for example, the neglect of the safe maxim, to refrain from the use of the sound immediately before a menstrual period is approaching.

By keeping the forefinger of the right hand at the os uteri, and placing its tip on the concave surface of the sound when it has

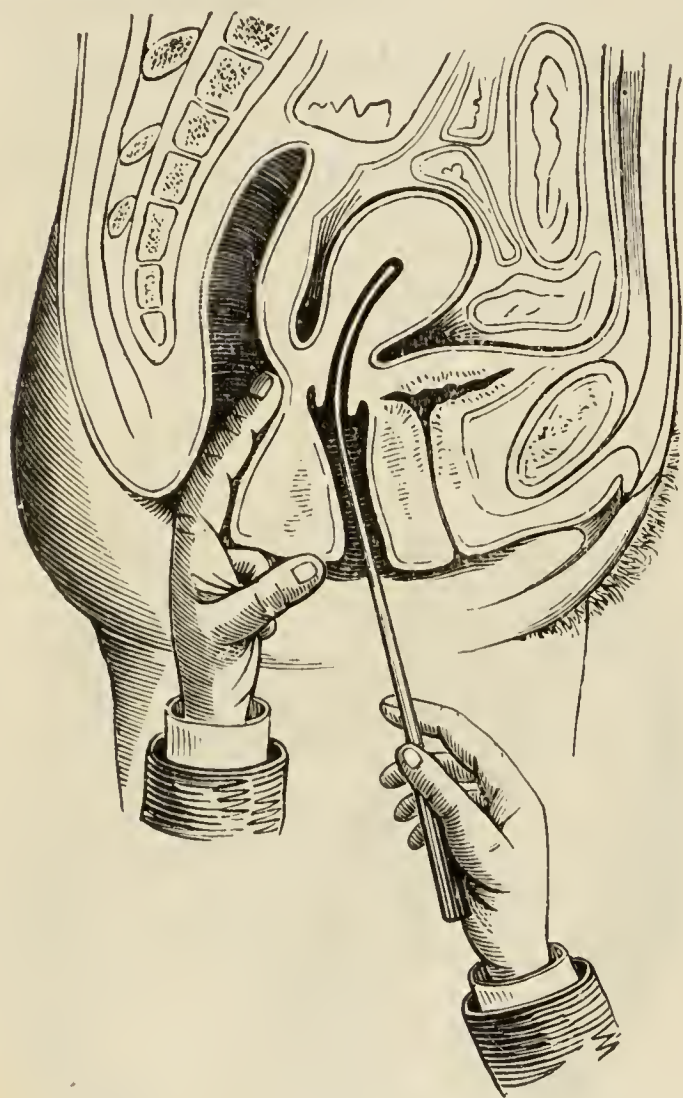


FIG. 59.—SOUND IN UTERO; RECTO-UTERINE EXAMINATION.

penetrated to its full extent, we can estimate, by the graduated grooves, the exact length of the uterine canal. Before removing it we can test the mobility of the uterus, raise it, or replace it in position; and also judge comparatively, by utero-rectal, utero-abdominal, and utero-vaginal examination, of any abnormal connection of the uterus with some neighbouring viscus, or attachments that have formed between it and other morbid pelvic and abdominal formations and growths.

In introducing the sound it may be caught and arrested by some fold of mucous membrane, or the knob (which should always be of fair size) may enter a small

follicular cul-de-sac. By partly withdrawing, and gently passing it on again,

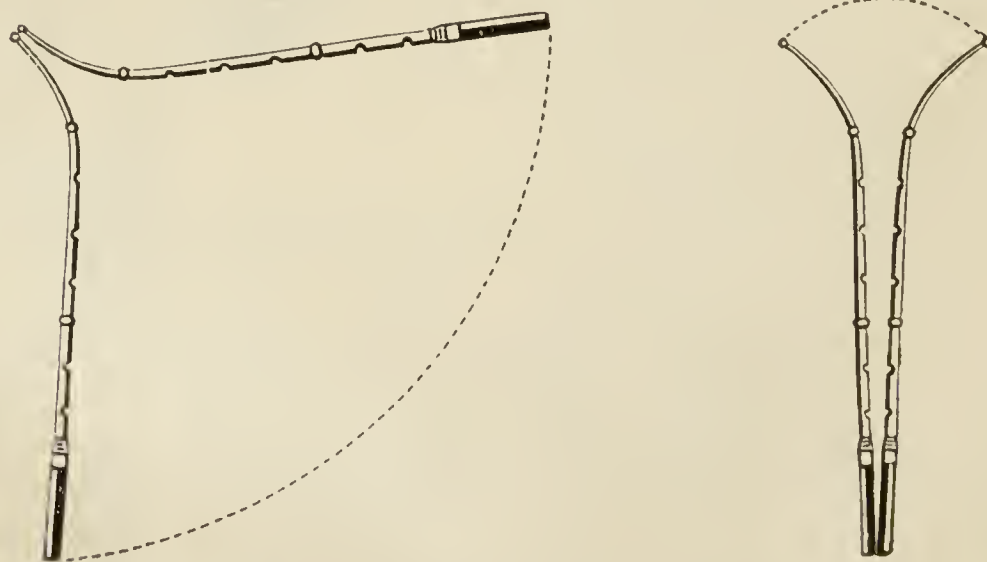


FIG. 60.—PROPER METHOD OF ROTATION OF THE SOUND, AS COMPARED WITH THE IMPROPER. (HART AND BARBOUR.)

we get over the obstruction. Again, at the isthmus we may find its passage impeded. One golden rule must be observed—never use force. Better to withdraw the knob of the sound from the uterus, and with the finger in the vagina give the point of it a new curve, bending it a little more forwards or backwards, or laterally, and again try to slip it into the cavity of the fundus. Frequently, in extreme cases of anteversion or retroversion, we shall succeed in passing it by thus repeatedly altering its shape and changing the direction of the handle, until we hit off that which enables it to pass through the altered curve of the uterine canal.

In extreme retroversion we may have to carry the handle forwards to the pubes, and direct the concavity backwards;* we next feel for the os uteri, and pass the sound on wards, giving the handle such elevation or dip as will assist the knob to pass on into the cavity. When the elbow of the sound is reached, by a semicircular sweep, we revolve the sound on its axis and thus alter its direction, while at the same time, by lowering the handle, we raise the uterus from its depressed position (Fig. 61).

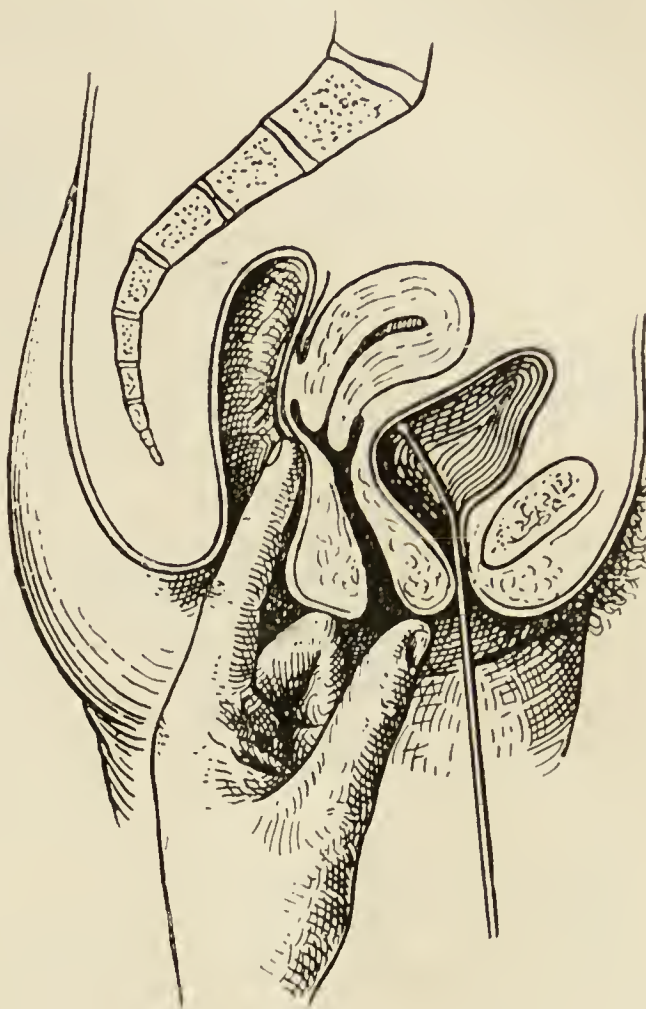


FIG. 61.—RECTO-VESICAL EXAMINATION.

The Urine.—An examination of the urine is often required, and, indeed, few cases of any complicated local affection can be viewed satisfactorily, either from a diagnostic or prognostic aspect, unless a urinary examination be made.

In Oliver's test-papers we have very delicate tests for albumen; and the examination may be carried out at the bedside, all we require being a small test-tube. I have found the potassio-mercuric-iodide the most delicate of these papers, detecting albumen where heat and nitric acid have failed. The indigo-carmin papers are equally reliable for sugar.

This table of comparative analyses of male and female urine by Becquerel may be useful as a guide in judging of abnormal urine:—

* See chapter on 'Retroversion.'

COMPARATIVE ANALYSES OF MALE AND FEMALE URINE (BECQUEREL).*

	Mean Com- position of Four Healthy Men.	Mean Com- position of Four Healthy Women.	General Mean.
Specific gravity	1018·9	1015·12	1017
Percentage of water	96·88	97·50	97·19
„ „ solids	3·11	2·49	2·80
„ „ urea	1·38	1·03	1·21
„ „ uric acid	0·039	0·040	0·039
„ „ other organic matter	0·92	0·80	0·86
„ „ chlorine (combined, fixed)	—	—	0·05
„ „ phosphoric acid	—	—	0·03
„ „ potash	—	—	0·13
„ „ soda, lime, and mag- nesia	—	—	0·39

We proceed in practice thus—

Take a specimen of the urine. Find its specific gravity at 60°, reaction with litmus, and the quantity passed in the 24 hours.

Albumen—sp. gr. 1006 to 1010. Test by Oliver's potassio-mercuric-iodide papers (I find it necessary, in order to avoid error, always to apply heat after a precipitate is obtained with Oliver's paper); heat 180°, and nitric acid a few drops—precipitate; Pavy's citric acid and ferro-cyanide pellet. Heller's test—small quantity of urine and cold nitric acid allowed to run down the side of the test-tube.

Phosphates—sp. gr. increased slightly: heat 180°, precipitate obtained, which nitric acid dissolves; phosphatic crystals under microscope.

Urates and uric acid—sp. gr. 1025 to 1030; heat dissolves; hexagonal or rhomboidal crystals of urea, with nitric acid; also uric acid crystals under microscope.

Sugar—sp. gr. 1030 to 1050. Johnson's picric acid test; indigo-carmin test of Oliver; Trommer's and Fehling's Tests; Pavy's pellets afford a ready, convenient, and reliable test for sugar (directions accompany).

Pus—Coagulates with heat; deposit forms homogeneous layer at bottom of glass; becomes gelatinous with liquor potassæ; mixes with the urine; pus corpuscles under microscope.

Mucus—Deposit often glairy, tenacious; urine generally alkaline; is not miscible with urine; rendered less dense by liquor potassæ; acetic acid gives a sort of membrane floating in the urine.

Blood—Discoloration with heat; formation of coagulum; blood corpuscles under microscope. Almen's test—freshly prepared tincture of guaiacum and ozonized ether—blue colour.

* 'Urinary Analyses.'

PROPORTION OF URINARY CONSTITUENTS IN NORMAL URINE.*

	FOR ADULT MAN.	FOR ADULT WOMAN.
Total quantity of urea in 24 hours.	35 grammes	30 grammes.
Percentage of urea	2.35 %	2.3 %.
Total quantity of uric acid . . .	1 gramme	0.857 grammes.
Percentage of uric acid † . . .	0.066 %	0.066 %.
Ratio of uric acid to urea, 1 : 35.		
Total quantity of chlorine . . .	7.5 grammes	6.75 grammes.
Percentage of chlorine ‡ . . .	0.5 %	0.52 %.
Expressed as sodium chloride . .	3.6 grammes per oz.	3.8 grammes per oz.
Total quantity of phosphoric acid.	3.16 grammes	2.8 grammes.
Percentage of phosphoric acid . .	0.21 %	0.22 %.

Clinical Thermometer.—It may seem superfluous to refer to the value of an accurate record of temperature in arriving at a diagnosis, and conducting the management of a case. The importance of such a record is made more obvious if we reflect for a moment on the causes of nightly exacerbations of temperature, or a daily elevation of a few degrees above the normal standard. In peritonitis, pelvic hæmatocele, metritis, suppurating cysts, acute vaginitis; in chronic peritonitis; in uræmic and septicæmic states, and cystitis, we may expect the characteristic rise and fall in the temperature range. In pelvic effusion, especially if pus be forming, the nightly exacerbation is the rule; in ectopic gestation also the temperature record is valuable.

With the previous history of a case, an accurately kept chart of the temperature will materially assist a physician in forming a correct diagnosis.

An Anæsthetic is absolutely necessary to enable us to arrive at a correct diagnosis in certain cases of uterine and adnexal tumours, in the differentiation of pelvic from abdominal tumours when we require complete relaxation of the abdominal wall; also when there is a suspicion of phantom pregnancy, and when there is great sensitiveness of the parts, rendering an examination without it extremely difficult, if not impossible.

As to the choice of an anæsthetic in operative gynæcology, this must always to a certain extent depend upon the individual case under consideration. I was one of the first in the United Kingdom to strongly advocate the employment of ether in general surgery,

* This is the standard proportion on which the Clinical Research Association analyses are estimated. I am indebted to the Director for this table.

† Somewhat high—corresponds with recent and more accurate analyses.

‡ According to Parkes—rather high.

and for many years most of my operations, abdominal and other, were done under nitrous oxide gas and ether.* Previous to this I had myself administered methylene and chloroform some fifteen to sixteen hundred times without an accident, and I have never had a fatal result with gas and ether. Oxygen was first given for me by Dudley Buxton both as a prophylactic and restorative. Only on the rarest occasions have there been respiratory or heart complications. For the last few years I have used chloroform in all my *abdominal* cases, believing that some serious gastro-intestinal symptoms were induced by ether, such as persistent vomiting, foul tongue and breath, fœtor of the evacuations, distressing cough, and bronchial complications. I am convinced that these post-operative consequences are less frequently met with after chloroform. On the other hand, I feel that occasionally chloroform with ether is the preferable anæsthetic, and that there are abdominal cases in which the administration of chloroform, touching both the safety of the patient and the comfort of the operator, should devolve on specially skilled hands. Now that we know the limits within which anæsthesia may be secured and maintained in the case of chloroform (half to 2 per cent. of air) and that we have in the inhaler of Vernon Harcourt an apparatus which registers accurately the percentage of chloroform inhaled, we are on much more certain ground than in the past.

In previous editions I entered fully into the question of anæsthesia, and the different methods of administration. This, however, is now unnecessary, inasmuch as every student and practitioner has the opportunity of making himself proficient in these. It is of unspeakable advantage to a surgeon when his operation is conducted under the skilled and experienced hand of a thoroughly reliable anæsthetist. In the accidents and emergencies of abdominal surgery, in the necessity for prolonged administration in the face of collapse from shock and hæmorrhage, the skill and resources of the anæsthetist are put to the test to save the operator from distraction, and to enable him with confidence to proceed.

In our natural desire to record our most striking surgical successes, we are too often led by a rather selfish egoism to forget altogether, or at least to minimize, the extent to which we are indebted for our results to the skilful administration of an anæsthetic. A prolonged operation is frequently one in which there is considerable loss of blood, and as a consequence associated shock; yet it is often under these very conditions that we require the full

* 'Medical Responsibility in the Choice of Anæsthetics, with the Anæsthetics employed and the Mode of Administration in Fifty Large Hospitals in the United Kingdom.' Lewis, London, 1876.

anæsthetic effect, and while we demand absolute immobility of the patient, we trust entirely to the skill of the administrator, and trouble ourselves only with immediate regard to our own manipulations. In our anxiety for exactitude and celerity, we take no count of the judgment that determines the approach of shock, that is ever on the alert for the accidents of anæsthesia, and that forestalls these without any unnecessary fuss or distraction of our attention. Changes in the position of the patient, re-sterilization of infected parts, as well as the hands of the operator and his assistants, are under anæsthesia easily effected. If we can thus complete the thorough sterilization of the abdomen and vagina, immediately before operating, without distressing the patient, so can we finish the abdominal toilet, and carry out all its aseptic details, before she recovers consciousness. Also, as the success of an operation must depend in great measure upon our pre-knowledge of its nature and the probable steps that the peculiarities of the case will demand, our decision must be based upon an accurate diagnosis, which latter can only be arrived at in many instances by the assistance of an anæsthetic.*

I have operated in several cases requiring prolonged anæsthesia in which the chloroform was administered by Vernon Harcourt's inhaler, and with perfect satisfaction. For the greater part of the operation the percentage of chloroform administered did not exceed from half to one per cent. Dudley Buxton, who gave the anæsthetic in these cases, writes as follows :—

‘By means of this apparatus the vapour of chloroform is mixed with air; all dilutions from zero to 2·5 of chloroform can be obtained. When the patient is fully narcotized and the pupils contracted, which occurs usually when a 2 per cent. vapour is given, but sometimes, especially in the case of children, when only 1 per cent. or 1·5 per cent. is reached, the operation is commenced. The time of induction varies, but five to ten minutes is the average duration. Usually the strength of 1 per cent. or even less is competent to maintain a complete narcosis. I have used this

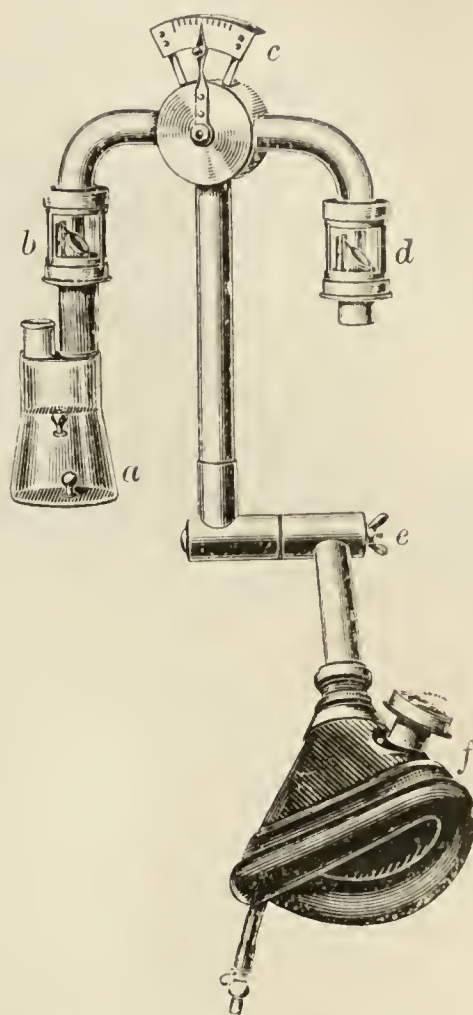


FIG. 61a.—MR. VERNON HARCOURT'S CHLOROFORM REGULATOR.

a, Two-necked bottle filled as far as top of conical part with chloroform; *b*, inspiratory valve, through which air enters after passing over surface of the chloroform in *a*; *c*, stop-cock and pointer, the former regulating, the latter indicating, the percentage of chloroform inhaled; *d*, inspiratory valve; *e*, joint for keeping apparatus vertical, an essential in order that the valves shall work true; *f*, expiration valve.

* Ethyl chloride has been given for the author by Mr. T. Bakewell in several cases, but always in conjunction with gas and ether.

apparatus now for a large number of the most severe operations, including bad brain cases, cholecystectomies, enterectomies, stomach operations, short-circuitings, ablation of plunging goitres, with severe dyspnœa, abdominal sections for hysterectomy, and pelvic operations, some of which have lasted a long time and have never failed to obtain a most satisfactory anæsthesia, placid as sleep and apparently without in any cases causing narcotization of the medullary centres. The amount of excitement is usually very slight, and after-effects are certainly less than when higher percentages are employed. The patients appear to have little discomfort, and from personal trial it may be shown that low percentages are tolerated and hardly noticed as the narcosis is in progress. If a higher percentage than 2 per cent. is needed—which I am inclined at present to doubt—it can always be obtained.

‘Speaking from my own experience, I can only affirm that I am convinced that Vernon Harcourt’s regulator is immeasurably superior to any other apparatus at present in use. A little intelligence and study render it easy to master its technique. In praising this apparatus, I must add that it is only an apparatus, and although it minimizes dangers, it does not, of course, obviate the necessity that the person using it shall know the principles of chloroform, anæsthetization, or the necessity that he shall possess that sense of responsibility which alone can qualify to undertake the conduct of an anæsthesia.’

Some Rules to be observed in the administration of any Anæsthetic.

1. When possible, the operator should not be the anæsthetist.
2. The latter should not be conversed with during the administration.
3. The anæsthetist should not leave.
4. The heart and lungs of the patient should be examined before administration.
5. The stomach should be comparatively empty.
6. The temperature of the room should be at least 60°. The body ought to be free, and all tight clothing should be loosened.
7. Any artificial teeth should be removed.
8. The breathing and countenance should be carefully watched all through the administration, which should immediately cease on the warning of danger in failure of the pulse and signs either of cerebral anæmia in the face or of asphyxia. By pulling the lower maxilla upwards and forwards, placing the thumbs behind the ramus at either side, the patient’s jaw is raised, and with it the hyoid bone. The tongue may be pulled forward with a tongue forceps, the body inverted by Nelaton’s method, and galvanism applied along the course of the pneumo-gastric or over the heart, while strychnine or sulphuric ether is injected subcutaneously. Artificial serum may be used if there be shock from hæmorrhage. In cases in which prolonged anæsthesia is anticipated, and the circulation feeble, the subcutaneous use of strychnine before operation is advisable.

Howard, of New York, advocated the complete extension of the head and neck as the best means of raising the epiglottis and hyoid bone. He maintains that this plan is much more efficient than elevation of the jaw; also, he contends that traction of the tongue does not raise the epiglottis. Bringing the head over the edge of the table or bed, so that it may swing quite free, he carries it firmly backwards and downwards, by placing one hand under

the chin and the other on the vertex. The utmost possible extension of the head and neck is thus maintained. The skin is to be made quite tense.

9. While the patient is passing under the influence of the anæsthetic or coming therefrom, silence should be kept and no observations bearing on her case or the operation be made.

I have spoken of the examination of the heart before the administration of an anæsthetic. Of course, it is well known that the most experienced anæsthetists daily administer ether, chloroform, and nitrous oxide, without taking this precaution. I do not think that is an example to be followed by the ordinary practitioner, or by any one whose

opinion may not have sufficient weight with an ignorant jury. If the anæsthetist be a specialist, and considers such an examination a matter of form or superfluous, in the event of a fatal issue he can better set himself right before a coroner's court than one who is not in the position of an expert.

Cocaine.—Local anæsthesia of the external genitals and vagina may be effected by the use of cocaine, either in the form of ointment (10·20 per cent.) or solution. The ointment may be freely smeared over the part or applied on a piece of cotton-wool. In the case of a sensitive vulvar orifice, cocaine may be used for the purpose of examination, but this is rarely necessary. It is useful in some minor operations on the vulva, and may be applied for any painful operation to the external surface of the cervix. A variety of minor operations may be performed on the outlet with the electrocautery painlessly under cocaine. Lanolated lard is the best basis if we use it as an ointment (lanoline \mathfrak{z} ss., lard \mathfrak{z} iv., rosewater \mathfrak{z} i.).

Spinal Analgesia.—The production of analgesia by sub-arachnoid injections of cocaine, on account of the attendant sickness, the subsequent headache, and the probable difficulty of operating in the face of unexpected complications, is not likely to be of much use in intraperitoneal operations. Tuffer, who has operated over 250 times under cocaine analgesia, is of this opinion.

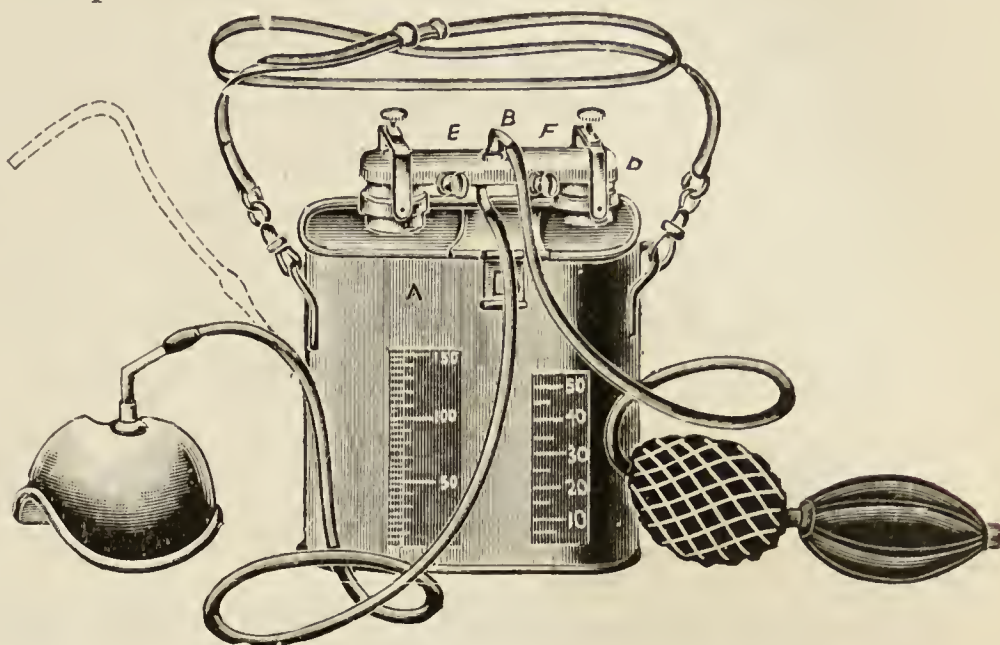


FIG. 62.—CHLOROFORM AND ETHER INHALER.
(SCHAEDER, LEIPZIG.)

A, nickel case, with two bottles—larger for ether, the smaller for chloroform. E, F, tube communicating with the bottles. By taps the bellows can be turned on to either or both of the bottles. By these taps the relative amount of the anæsthetics can be regulated. This is an admirable inhaler for the administration of either chloroform or ether, or both.

A needle is entered one centimetre to the right of the fourth lumbar spinous process, and when the sub-arachnoid fluid escapes the cocaine is injected. The patient is sitting with the trunk bent slightly forwards.*

Tents are employed for exploration of the uterine canal, as in cases where we suspect polypus of the uterus, retention of portion of the membranes after abortion, and in menorrhagia, when we are uncertain of the cause of the discharge. Their employment in certain operative procedures I shall have occasion to refer to.

Tents used in this country are of three kinds—sponge, sea-tangle or laminaria, and tupelo-root (*Nyssa multiflora*). There are certain

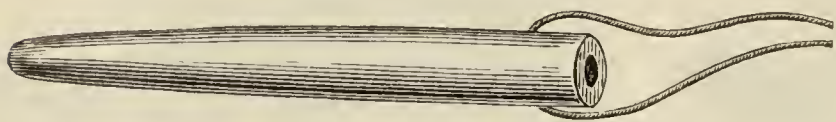


FIG. 63.—TUPELO TENT.

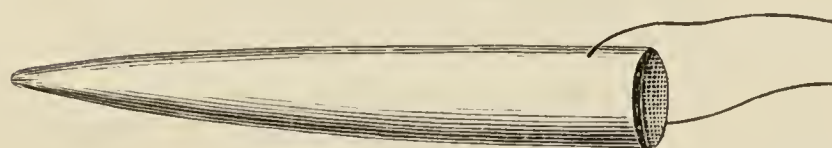


FIG. 64.—SPONGE TENT.

dangers that may follow from any kind of tent: uterine colic, collapse, metritis, peritonitis, parametritis, tetanus, septicæmia. I have twice seen an alarming condition supervene within three

hours after the introduction of a single laminaria tent into the uterus—agonizing pain, symptoms of collapse, fainting, etc. Laminaria tents, if left in too long at first, are apt to break, and their extraction, save by enlargement of the cervical canal, has proved a matter of difficulty. Sponge-tents I rarely use in strictly gynæcological work. I would limit their employment altogether to obstetric cases. For tupelo it is claimed that it is cleaner to use, not so apt to break, is more uniform in its gradual enlargement in the uterus, and easier of removal; its power of absorption is greater, and hence its action is more rapid. I have constantly employed it, but of late years only use laminaria.

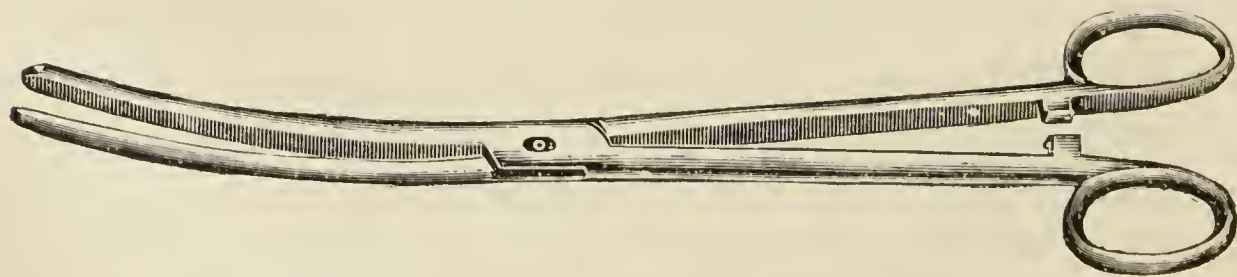


FIG. 65.—FORCEPS FOR INTRODUCING TENTS.

Any long forceps will answer. When the uterus is drawn down with the hook or vulsellum the tent can be introduced with the hand. The forceps also answers admirably for carrying gauze into the uterine canal.

Some special rules should be adhered to in the use of tents. Do not insert them *immediately* before a menstrual period, nor leave them in longer than

* Greely, *Annals Gyn. and Ped.*, October, 1903.

twelve hours (sponge-tents not over six hours), and never for this length of time without visiting the patient. On no pretext leave a patient for a night or a day, with a tent in utero, without assistance being within reach if required. Bromide of ammonium (20-30 grains) or bromide of potassium should be given at night when dilating with a tent. Let the patient lie in bed when the tent has been inserted. Force should not be used in the introduction of tents, and great care be taken *when there is any history of recent perimetritis, or in patients prone to peritoneal inflammations*. At all times an intelligent attendant should be left with the case after a tent is placed in utero. Anticipate any septic consequences, so far as is possible, by the use of antiseptic tents (see chapter on Asepsis, etc., for the preparation of laminaria tents), taken from a solution of iodoform and ether. To introduce a tent, we place the patient in the dorsal position (*having taken all the preliminary precautions for rendering the vagina aseptic*). The uterus is steadied with a hook or tenaculum; and the tent, slightly curved, is intro-

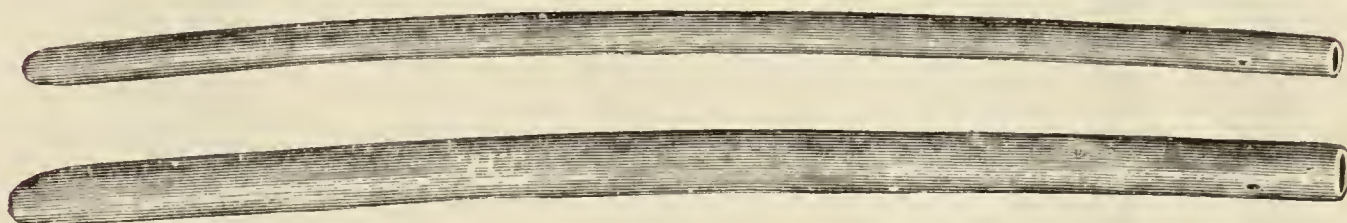


FIG. 66.—NATURAL SIZE OF TWO OF THE SMALLER LAMINARIA TENTS USED BY AUTHOR, TAKEN OUT OF IODOFORM AND ETHER.

They are easily bent to any curve we require. (See chapter on 'Asepsis.')

duced with a long forceps. A tampon of sterilized iodoform gauze is loosely packed in over the protruding tent. If any difficulty be experienced, the uterus should be drawn well down and fixed with the tenaculum, so as to obtain steady control over it.

Forcible Dilatation may be carried out by any of the different forms of dilators which have been devised for this purpose. In Hegar's (Kumerlé, Freiburg) dilators the size of each is marked on the short handle of the bougie. It is simply catheterization of the canal by short ebonite bougies. I have had specially made for the same purpose, and find they answer much better, conical metal bougies of aluminium, varying in their longest circumference from 11 millimetres to 59; but they may with benefit be two sizes larger than this last diameter. They have a bulbous point, with a short neck, which gradually expands into a belly. The curve of the bougie is a circle, having a diameter of 25 centimetres. In using these bougies it is well to have the patient in the dorsal position and drawn well down to the edge of the table. The metal can always be kept smooth and bright, and, when oiled, slips with slight force through the cervical canal. If the uterine canal be partially dilated by tent previously, the requisite degree of full dilatation can afterwards be easily obtained with a suitable metal or vulcanite dilator. There is no risk of any 'disastrous consequences,' unless rash, unwarrantable force be employed. The dilators of Leiter I prefer to those of Hegar.

Expanding and Irrigating Dilators.—Several varieties of expanding and irrigating dilators, rarely if ever used by any experienced gynæcologists,

have been devised with considerable ingenuity, as in the case of curettes. In previous editions I have figured several of these. They are absolutely unnecessary, and are more ornamental than useful, the dilators and methods of dilatation described being quite sufficient for every purpose.



FIG. 67.—LIGHT VULCANITE DILATORS OF LEITER.

These are admirable, and can be kept in any antiseptic solution.

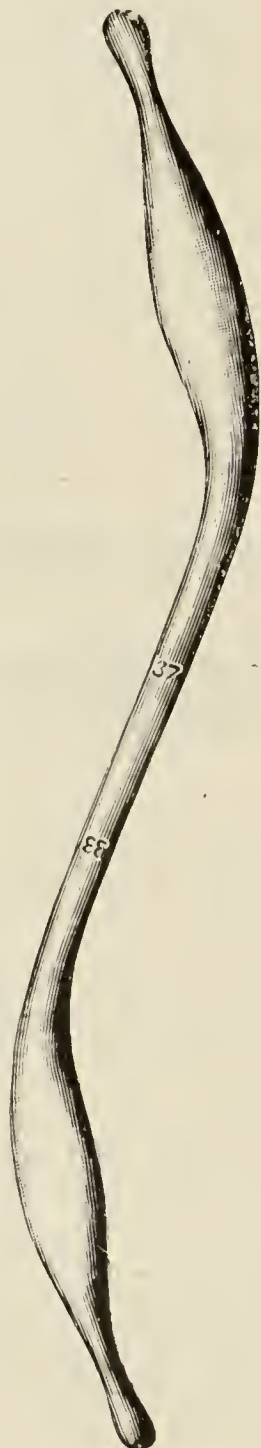


FIG. 68.—AUTHOR'S GRADUATED BULBOUS ALUMINIUM BOUGIES.

The ends are of different sizes.



FIG. 69.—HEGAR'S DILATOR.

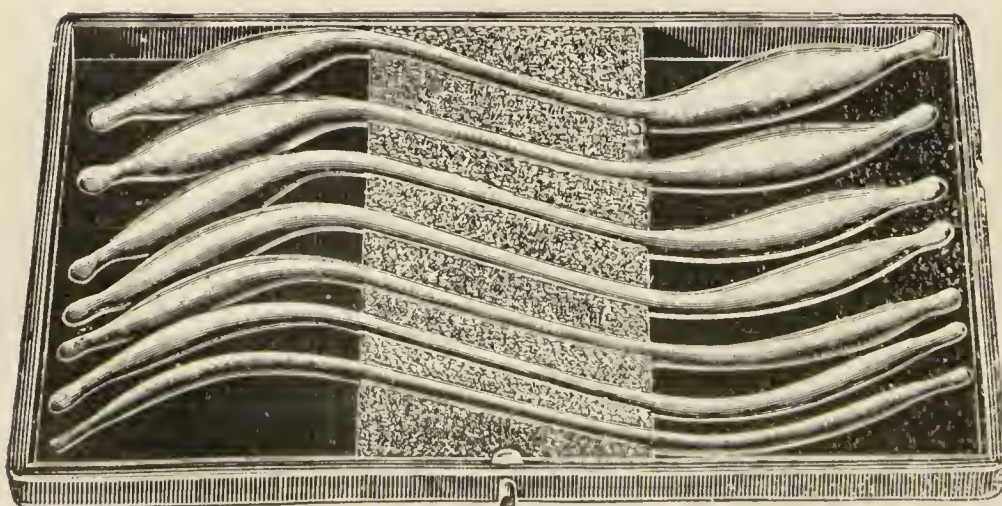


FIG. 70.—CASE OF SEVEN BOUGIES.
14 sizes graduated in millimetres.

CHAPTER III.

FIRST STEPS OF EXAMINATION OF A CASE (continued).

Mode of Examination.—I now assume that a pelvic, ovarian, or uterine case, as pelvic hæmatocele, ovarian or adnexal tumour, or fibrocyst of the uterus, is brought for examination. Let us proceed to exhaust the means at our disposal, so as to arrive at a correct diagnosis. We have inquired into the previous history, the character of the menstrual secretion, and the action of bowel and kidney; we have taken the temperature and pulse. We note the woman's countenance—if cheerful and hopeful, or expressive of pain and anxious; if emaciated or cachectic; if characterized by the *facies ovariana*. There is in ovarian dropsy a strange mingling of facial emaciation with anxiety of the countenance, often out of all proportion to the interruption of the general health; it is altogether different to the countenance of pregnancy, and quite distinct from the cachexia of ordinary malignant disease. This appearance, however, we must remember, is influenced by complications, such as phthisis, hepatic or renal disease, pregnancy, or malignant disease of the ovary. But in hepatic and renal disease we have other evidence—such as anasarca, icterus, distended abdominal veins, œdema of the face, hands, or feet, albuminuria, and perhaps cardiac complication—to indicate the cause of the distension.

We now proceed to examine the abdomen. I cannot insist too emphatically on the care with which we should explore it before we proceed to any internal examination.

Examination of Abdomen.

Its Shape.—We notice if it be barrel-shaped and arched, as in ovarian dropsy, or if the swelling be unilateral or uniform; if the sides bulge, more or less, as in ascites, or if the tumour be evidently central, and if its ratio of increase has been regularly progressive,

as in pregnancy ; if there be distinct swellings in different regions, and the surface of the abdomen be irregular in outline, as in multilocular cysts, malignant solid growths, or tumours of the liver and spleen.

The Umbilicus.—Examine if it be prominent, as in pregnancy ; bulging and watery-looking, as in ascites ; drawn in, as in solid tumours with adhesions, and in malignant cases.

The Appearance of the Skin.—If tense and thin, showing the prominent recti muscles underneath ; or œdematous, with a characteristic watery appearance ; if it be laden with fat ; if marked with lineæ albicantes, cracks, scars, maculæ, or any cutaneous eruption.

Measurements.—In ovarian dropsy the greatest circular measurement is at the umbilicus (more likely it is below it in ascites). Take lateral measurements to determine the symmetrical nature of the growth. During the early months of growth of an ovarian cyst these are asymmetrical ; they are symmetrical in pregnancy.

Palpation.—Nothing save experience in educating the finger to differentiate the various forms of tumours, solid and fluid, and any enlargements of the abdominal and pelvic viscera, can teach abdominal palpation. It is not to be learned by any verbal description. The size of an organ, the extent of an enlargement, the degree of hardness or softness, the character and extent of fluctuation, the nature and direction of the pain caused by pressure, the appearance of the fluctuating wave, and the sensation of superficiality or depth conveyed to the hand when testing the abdomen for this sign—all have to be kept in mind in palpation. A few directions may, however, be of service. Have the patient's head and shoulders supported with a pillow ; let the surface of the abdomen from the sternum to the pubes be exposed ; stand facing the patient, and lay the palms of the hands lightly on the abdominal wall ; gradually pass the hands over the various abdominal regions, hypochondriac, epigastric, lumbar, umbilical, inguinal, and hypogastric. With the fingers explore these spaces carefully ; watch the patient's countenance for indications of shrinking or pain ; define as far as possible the limits of any growth, the region it occupies, its connection with surrounding viscera, if it be fixed or movable, if hard or nodular, if soft or fluctuating ; get the character of the fluctuation, if superficial or deep-seated ; carefully examine for mobile or floating kidney. Now lay the hand on one side of the abdomen, and tap lightly with the fingers on the opposite side, and feel the nature of the transmitted wave ; judge, by watching its movement under

the skin, of its depth (deeper wave in ovarian dropsy), and, by its freedom of motion in all directions, of the character of the cyst in which it is confined, unilocular or multilocular, and if the fluid itself be encysted, circumscribed, or free.

It is quite possible in a very fat patient to mistake the 'fat-thrill' for fluctuation. 'To muffle this,' says Goodell, 'I ask one of my assistants to lay the ulnar edge of his hand along the linea alba. The pressure of the hand will act exactly like the damper-wedge of the piano-tuner, which muffles the sound of one string while its fellow is being tuned. By this means I get the wave-tap of a fluid, and am enabled unhesitatingly to say that there is a liquid collection in the abdominal cavity.' Thus a fat abdominal wall may completely obscure the diagnostic aid we obtain from our sense of touch, and has doubtless led to many of the errors of practice, recorded and unrecorded, in the operative interference with abdominal enlargement.

Percussion.—We require to distinguish the relative degrees of dulness or resonance in the different regions, above the umbilicus, below it, and in either flank, and in the influence of posture on the percussion note. The rule is, that ascitic fluid falls with gravity (if the fluid be free in the peritoneal cavity, and not restrained by adhesion) into the most dependent position, which is, in the sitting position, the lower zone of the abdomen, and in the recumbent posture the flanks. Hence these regions will give a dull note.

In ovarian dropsy, on the other hand, the cyst rising up from the pelvis is in front of the intestines, which are displaced to either side, so that the anterior surface of the abdominal wall yields a dull sound and the flanks are resonant. Nor, as a rule, is the dulness changeable with posture, and never to the same extent as in complicated ascites. The complication of pregnancy with ascites or hydramnios, of ovarian dropsy with pregnancy, ascites, or cysts of the liver or kidney, all of which we occasionally find, compel us to be very cautious in placing reliance on percussion in diagnosis.

Auscultation.—The abdomen must be most cautiously examined for the different conditions likely to be confounded with pregnancy. It requires occasionally most patient and careful listening to detect the foetal heart-sounds, especially if there be a rather fat abdomen, any ascitic fluid in the peritoneum, or hydramnios, and if the foetal pulsations be weak and rapid. We have to be careful not to fall into an error that I have known occur with regard to a patient with a very rapid pulse, who suffered from an abdominal tumour which proved to be fibroid. The rapid aortic pulsations were transmitted to the tumour, and an opinion was consequently formed that the woman was pregnant. We must guard ourselves against the possibility of error, in cases

of assumed pregnancy, by the use of an anæsthetic in the determination of a doubtful case, and to exclude the presence of a phantom tumour.

Vaginal Examination.—We now proceed to make a vaginal examination. Whenever possible, an enema should be administered previously, and the rectum emptied. The patient may be in the lateral or dorsal position—preferably the latter. It is well on separating the labia, to inspect the vulva for any swelling, excoriation, discharge, sores, or tumours, at the same time marking the appearance of the clitoris, urethral orifice, hymen (if present), and fourchette. Moistening the finger—the nail of which should always be pared close—with an antiseptic cream,* we carry it gently into the vagina, noting the temperature of the latter. Reaching the uterus, we examine the condition of the os uteri, its shape and size, if normal, or abraded, soft, patulous, or fissured. The cervix uteri is next examined, as to its position, shape, length, and degree of hardness. Placing the finger firmly on the cervix, we estimate by pressure the mobility of the uterus. At the same time we contrast the anterior and posterior wall of the cervix, examine for any sulcus in the uterus, any special hardness in the uterine wall, or any fibroid which may here be developing. The finger is now swept, commencing anteriorly, round the vaginal roof, and any fulness, contraction, hardness, or swelling is detected and examined. The degree of tightness or stretching of the vaginal roof is estimated. We next pass to the posterior aspect of the uterus, and explore the utero-rectal space and the pouch of Douglas. In this latter space we may find a tumour, ovarian cyst, a faecal accumulation, some cellular and peritoneal effusion, the fundus of a retroverted uterus, or a prolapsed ovary. We take advantage of the act of respiration and the influence of the diaphragm on the pelvic viscera, by directing the patient during this examination to draw a few deep inspirations, followed by prolonged expirations. This will help to bring the ovary more within reach of the finger. In many cases, by directing the woman to lie towards the opposite side to that of the ovary we wish to examine, and by passing the forefinger (that of the right hand for the left ovary) up to the vaginal roof, while with the fingers of the other hand we firmly depress the abdominal wall into the pelvis, we can get the ovary between the fingers and define its limits and also trace the Fallopian tube for its entire extent.

* A tube should be used, not a crock, so that a fresh supply may be had at each examination, and the risk of contamination avoided.

While thus examining, we do not forget the possible presence of stone in the bladder, which may be detected through the vaginal wall in front. Before withdrawing the finger we satisfy ourselves thoroughly as to the character of recent effusions, the size of the ovaries, or if the remains of any old effusion occupy the cellular tissue, or be inside the peritoneum.

Conjoined Examination.—This we carry out either by the two hands or by the sound and hand.

By the hands	{	Abdomino-vaginal.
		Recto-abdominal.
		Recto-vaginal.
By the sound and hand	{	Utero-abdominal.
		Utero-rectal.
		Recto-vesical.

Abdomino-vaginal.—We want to ascertain the size of the uterus, its degree of mobility, its sensitiveness ; the condition of the bladder ovaries, and broad ligaments. We do this in the most satisfactory manner by placing the fingers of one hand on the abdominal wall above the pubes, and the first or two fingers of the other in the vagina, resting on the cervix, thus getting the organ between the two hands. In every case of obscure uterine affection, when we wish to know accurately the volume of the uterus and its relative increase in size, this is an indispensable step in our examination. We cannot too strongly urge the importance of this method of examination in palpating the ovaries. ‘The invagination of the pelvic floor is of the utmost importance, as by this means the examining finger is practically lengthened by the amount of the invagination, or, what is the same thing, the vagina is shortened’ (Kelly).* The patient having been anæsthetized and drawn well to the edge of the couch, with the thighs held apart by the assistant or nurse, or supported in leg-rests, such an examination cannot fail to reveal the true state of the uterus and adnexa. We can then reach higher up in the pelvis, and gain more complete information by the introduction of both the fore and middle fingers.

Recto-abdominal.—Withdrawing the finger from the vagina and again anointing the surface, we pass it gently into the rectum. In doing so, we reach, unless the uterus be retroverted, the cervix uteri, and feel it prominent through the anterior wall of the rectum.

Depressing the uterus well with the fingers on the abdomen, we now

* See p. 59, Fig. 34.

reach the ovaries, which can again be explored, and their size and sensitiveness ascertained. We may also satisfy ourselves of the volume and position of the uterus, of the dimensions of a fibroid. We likewise judge of the degree of congestion of the rectal mucous membrane, and the extent to which the rectum is interfered with either by cellular effusions, collections of fluid in Douglas' space, or a retroverted uterus.

Recto-vaginal.—Still keeping the finger in the rectum, we insert the index-finger of the other hand into the vagina. Examination

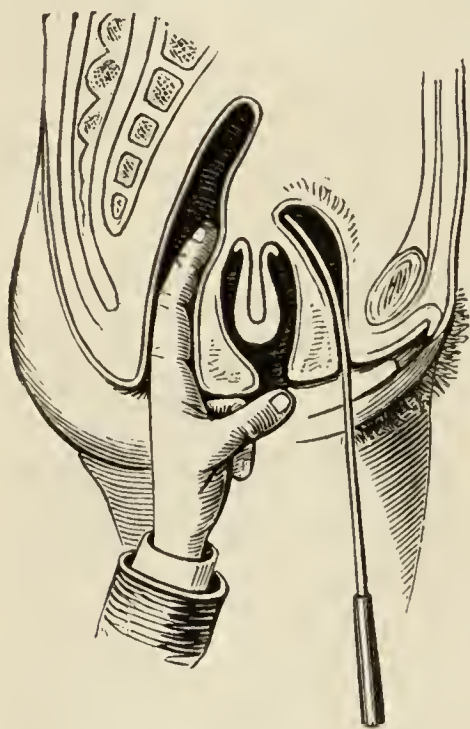


FIG. 71.—RECTO-VESICAL EXAMINATION IN COMPLETE INVERSION OF THE UTERUS.

of the rectum often gives such distress to the patient, that the less frequently we introduce the finger into it the better. Therefore, I generally prefer to use the index-finger of the right hand in the vagina, the woman lying on her back, the left forefinger remaining in the rectum. We can thus in the best manner determine the state of the rectum, the utero-rectal space, the position and size of the ovaries, and the character of any tumour, swelling, or effusion between the uterus and rectum.

Recto-vesical.—If there be any doubt which the uterine sound may remove, we slip it into the bladder while we retain the finger in the rectum. We thus are enabled to judge of the position and size of the uterus in fat women, in whom palpation is difficult, determine the presence of the uterus in atresia of the vagina, of its absence in inversion, and to diagnose between inversion and polypus. While the sound is in the bladder, if there be vesical irritation, we judge of its capacity, how far it is encroached on by the uterus, and exclude the existence of stone.*

Utero-abdominal.—Should we determine to use the sound we may by its means judge of the position, mobility, and length of the uterine cavity, or of any obstruction. In doing this we place the right hand over the pubes and manipulate the uterus on the sound. In diagnosing the relations of abdominal tumours, their connection with the uterus, and the extent to which the uterus is involved by fibroid growths, or polypus, the utero-abdominal method will occasionally be found to give valuable assistance.

* See page 73.

Utero-rectal.—Still retaining the sound in the uterus and passing the finger into the rectum, we can in a similar manner examine the posterior wall of the uterus, judge of the intramural fibroids, any adhesions posteriorly the degree of retroversion, how far the uterus is fixed by any effusion, and to what extent its freedom of movement is limited.

Other Steps.—In a large proportion of cases the examination just detailed, in part or whole, will enable us to arrive at a conclusion as to the nature of a case. It may, however, happen that doubt still remains. There is some discharge from the uterus, and we have to satisfy ourselves as to its source and nature. On examination with the finger, the feeling of the os uteri and cervix prompts us to use the speculum. An abdominal tumour exists, regarding the exact nature of which, or its contents, we are not perfectly satisfied. There is a quantity of abdominal fat or tympanitic distension of the abdomen, or the difficulty of making a satisfactory examination of the patient has been great. This difficulty may also result from nervousness, or sensitiveness and tenderness of the vagina. In all such cases an anæsthetic is indispensable.

Speculum.—In the case of discharge, we use the speculum to examine the os uteri, and judge of its source and nature. Also it may be requisite to see the vaginal walls; if they be stripped of epithelium, or granular and secreting a quantity of vaginal mucus.

A beginner may have some difficulty in passing the sound in the usual manner into the uterus. By placing the patient in the semi-prone position and using Sims' speculum, he can generally do so with ease. Or if she lie on her back, and a tubular speculum be inserted, he can bring the os uteri into view; and then, if the uterus be in its normal position or anteverted, by dipping the sound well down, he can, unless there be some obstruction, pass it on into the cavity. (See remarks on the 'Uterine Sound,' Chap. II.)

Tents.—A tent or uterine dilator may have to be employed, if we desire to explore the uterine canal in cases of suspicious and prolonged hæmorrhage, when we suspect intra-uterine or placental polypi, or where there is septic discharge, the consequence of any intra-uterine decomposition.

Aspiration.—We may draw off a small quantity of fluid from a doubtful abdominal swelling, to determine its nature by chemical or microscopical tests; this may be done with the ordinary hypodermic syringe or aspirating needle. The aspirator is specially useful for diagnosis in doubtful pelvic and uterine enlargements, such as retro-

hæmatocele, cystic tumours in Douglas' space, pelvic peritonitis, and retained menses.

An Aspirating Needle or subcutaneous syringe is often required to remove a little of the fluid in abdominal and pelvic tumours,

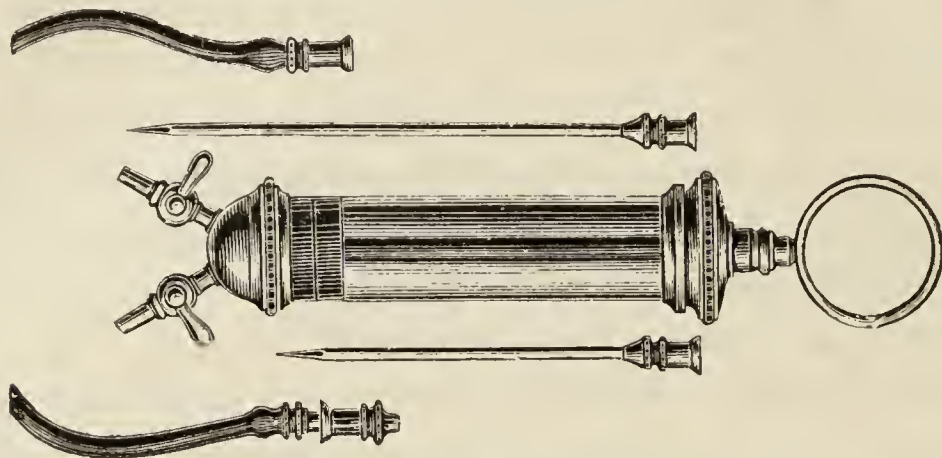


FIG. 72.—BARTLETT'S ASPIRATOR, MOST USEFUL IN EXPLORATION.

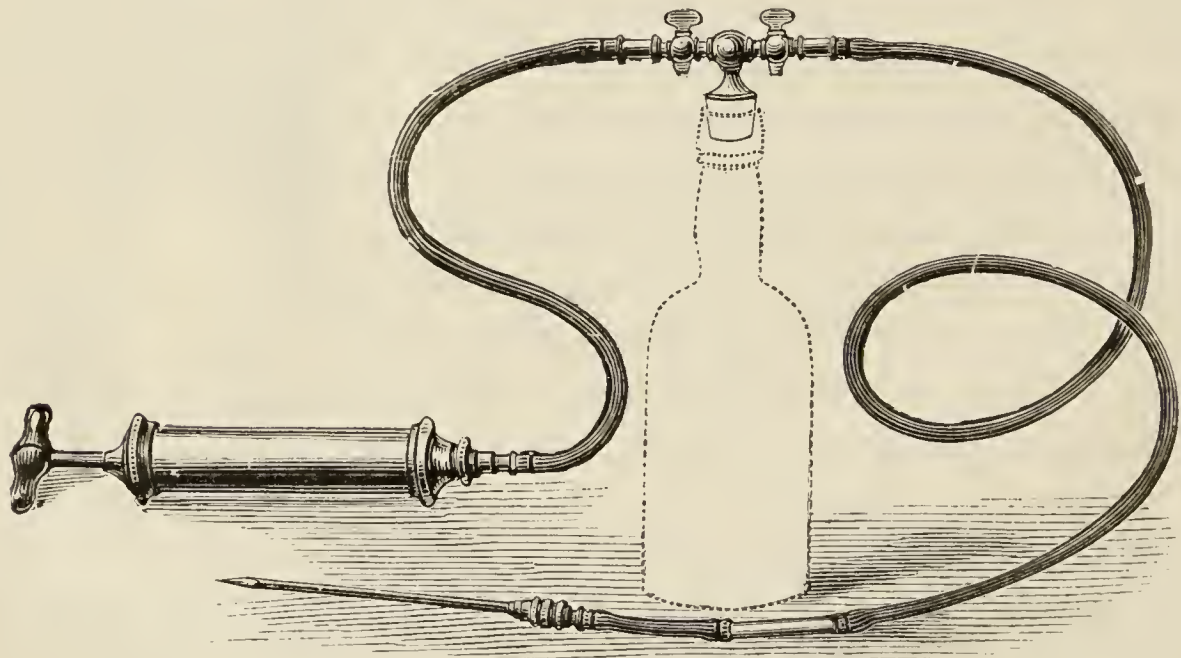


FIG. 73.—ASPIRATOR. (MATTHEWS BROTHERS.)

This is a most handy and simple appliance, and, together with the set of guarded needles and obturators furnished with it, answers every purpose.

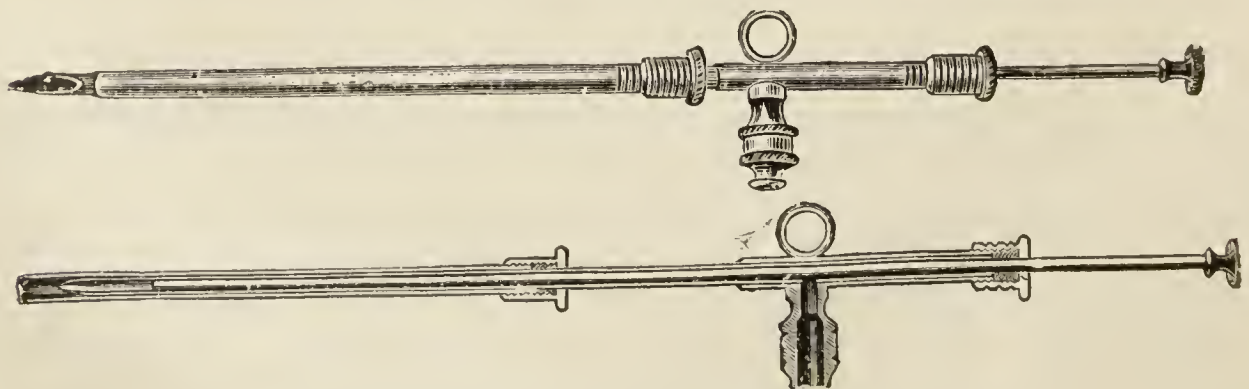


FIG. 74.—ASPIRATING NEEDLES.

in order to ascertain its nature by chemical and microscopical examination. We may draw the fluid from the point of greatest

distension—either vagina, rectum, or abdomen. The small exploring aspirator of Bartlett will be found very useful in the exploration of small cysts, and for purposes of diagnosis.

The Sound and Anæsthesia.—I have already said that the more experienced our tactile sense becomes, the less we require to use either sound or aspirator, or even the speculum, in diagnosis. Careful digital examination, aided by palpation, and by taking advantage of posture, is generally sufficient to enable us to come to a correct conclusion. But in all cases of doubt and difficulty it is better to exhaust the means of examination than to commit an error in diagnosis. To no aid in examination does this remark apply more than to the use of an anæsthetic. We do not avail ourselves as often as we should of anæsthesia in the elucidation of difficult questions arising in connection with complicated and obscure abdominal cases. It is not too much to say that in any such no final verdict should be given without its help.

It is in those cases in which difficulties arise, either from the quantity of fat in the abdominal cavity or gaseous distension in the bowel, where there is great pain and sensitiveness on the least attempt at examination, or when a patient is debilitated or weakened by previous prolonged suffering, that an anæsthetic is specially called for. In children and young girls an anæsthetic is often essential in order to make a thorough examination. Cocaine may be used, but I prefer, for complete examination, when any anæsthetic is required, either ether or chloroform. I feel confident that many errors of diagnosis would be avoided if we more frequently had resort to anæsthetics in examination of the abdomen and pelvis.

Rectal Exploration (Simon's Method).—This plan of exploration of the abdominal viscera is seldom practised in this country. In the instance of a mesenteric mass causing partial ascites and abdominal enlargement, I was enabled, by rectal palpation of the pelvic viscera, to arrive at a diagnosis. The woman should be fully anæsthetized. She is placed in the lithotomy position, her thighs are well drawn up to the abdomen; the sphincter ani is then thoroughly dilated by the fingers, or, better, by the thumbs; gradually the hand, well oiled, in the form of a cone, is most cautiously introduced in a rotary fashion; when the hand has passed into the bowel, the fingers can be separated a little so as to explore the pelvic organs; two fingers may be passed on into the sigmoid flexure of the colon. My hand measures, at the line of its greatest circumference, eight inches. I have thus introduced it without lacerating the anus. This is not the rule; even with the greatest care and a small hand, some sphincter fibres will be ruptured, and in some patients it is impossible to introduce the hand without serious injury to the sphincters and bowel. In ordinary dilation of the sphincters for obstinate costiveness it is not necessary to introduce the hand. It

is superfluous to point out how cautious must be the manner in which this procedure is conducted, and how seldom it is needful, considering the other means of diagnosis at our disposal. I may here draw attention to the methods of exploration adopted by Professors Naunyn and Ewald, the former injecting and filling the colon with water by the syphon plan, the latter inflating the intestines with air, so as to make the situation and relation of tumours to or in the abdominal viscera and intestines clear.

The Pelvic Organs in Children.

Value of Rectal Exploration in Children.—George Carpenter, of the Evelina Hospital for Sick Children, has written some important communications on the value of rectal examinations in the diagnosis of pelvic disease in children, instancing several cases in which grave conditions were discovered through combined rectal and abdominal examination by means of anæsthesia. The patient's legs are well drawn up, and the thighs are flexed on the abdomen. The pelvis is raised on a cushion, and, with the left hand placed on the abdomen, the right side of the abdominal cavity is explored with the right index-finger. The hands are reversed to examine the left side. The bowel and bladder have been previously emptied. The author has thus been able to diagnose and map out the position of a horseshoe kidney. By this means the appendix, the iliac fossa, the uterus and adnexa, may be explored, and the position of tumours or collections of fluid determined. Carpenter's remarks on the relations and dimensions of the female pelvic organs in children are of importance.

‘The sacrum in children is almost straight, and so is the rectum, the direction of the bowels being probably influenced by that of the bone. The infantile bladder is egg-shaped, with the larger end downwards, and as the pelvis is shallow, it is almost entirely an abdominal organ; but as soon as the child begins to walk the bladder sinks more into the pelvis, though even then its attachments are so loose that it readily rises wholly into the abdominal cavity when distended or otherwise displaced, a feature observed until puberty is near at hand. The uterus in the child is almost entirely made up of cervix, there being very little body, and it lies in the upper part of the pelvis. At birth the ovaries have descended as far as the brim of the true pelvis, but in children a few weeks old they are found close to the external iliac arteries at the side of the pelvis.

‘I have found, however, the uterus and appendages well above the brim of the pelvis on making a rectal examination in a child seven months old. Fig. 75 is a sketch of the tubes and ovaries of a child aged two years and four months that I made *ad naturam*, which shows the relative positions. Another sketch gives the exact size of these organs when removed from the body. It will be seen that the uterus is about 1 inch long and $\frac{1}{2}$ inch broad at the fundus, the tubes about $1\frac{3}{4}$ inches, the right ovary $\frac{5}{8}$ inch in length, and the left $\frac{1}{2}$ inch in length, and each about $\frac{1}{8}$ inch in diameter. The

ovaries vary in size from $\frac{5}{16}$ inch long by $\frac{1}{4}$ inch broad in a child a few weeks old, to organs measuring $1\frac{1}{2}$ inches by $\frac{1}{2}$ inch in a child approaching puberty. Intermediate sizes are found according to the age of the child, but ovaries show some variation in size in children of similar ages. The organs are for the most part elongated oval in shape, but organs that are more or less



FIG. 75.—GENITAL ORGANS REMOVED FROM A FEMALE CHILD, AGED TWO YEARS FOUR MONTHS. (GEORGE CARPENTER.)

Vagina opened behind, showing the external os uteri. The ureters are dimly outlined on either side. The round ligaments are ill developed.

round are occasionally found, and one ovary is not infrequently decidedly larger than its fellow. The Fallopian tubes, roughly estimating their diameter for clinical purposes, are about equal to the vas at a similar age at their narrowest part, but they gradually enlarge as they pass along to the fimbriated extremity; in length they vary from a little over 1 inch to a little over 3 inches, according to the age of the patient. The important anatomical guide to these structures when making a rectal examination is the falciform ligament. This falciform ligament, or the utero-sacral ligament, if that term be preferred, forms a sickle-shaped curve surrounding the rectum, attached behind to the sacrum, and in front to the lower part of the cervix. This is very well seen in both drawings (Figs. 75 and 76), and when the finger has passed some little distance up the rectum, its sharp edge is readily found, and is unmistakable. Using this structure as a guide, the tubes and ovaries, which, as the drawing (Fig. 76) shows, are on a higher plane, can be readily manipulated between the exploring finger and the bony wall of the pelvis, or bimanually, and while these structures are being examined, the ureters, the

right being shown in the drawing as it crosses the pelvis and disappears under the corresponding tube and ovary, can be examined.

‘It is sometimes possible to detect in the ovaries the small *cysts or dropsical Gräafian follicles*, which are not infrequently found post-mortem. The uterus, being a freely movable body, is not easily detected in this way, and readily

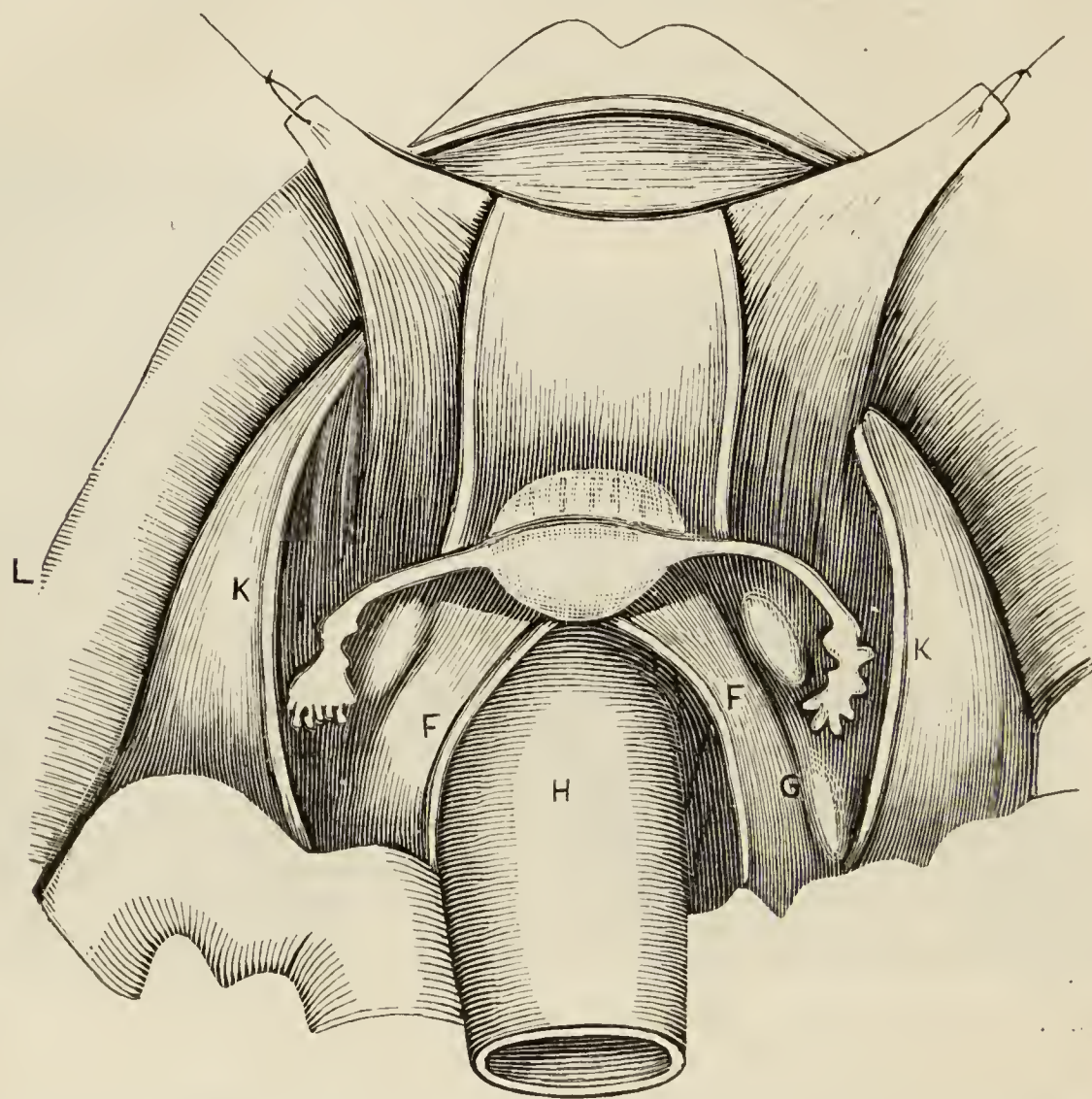


FIG. 76.—PELVIC ORGANS OF A FEMALE CHILD, AGED TWO YEARS FOUR MONTHS.
(GEORGE CARPENTER.)

F, falciform or utero-sacral ligaments; G, right ureter; H, rectum; K, brim of pelvis; L, reflected abdominal wall.

eludes the finger, which pushes that organ before it; but by a bimanual examination any marked abnormality can be easily appreciated, if the bladder be emptied. In young children the uterus can be rolled between the finger and the symphysis pubis, and its contour made out with ease.

Discharges.—In inflammatory states of the female genito-urinary organs, the nature and character of the discharge found, on vaginal examination, coming from the uterus, or in the vagina, and spontaneously appearing at the vulva, is of considerable moment in the diagnosis.

The following table will assist the student:—

DISCHARGES.

CHARACTER.	SOURCE.	APPEARANCE AND PROPERTIES.
Watery (hydropurulent), and mixed.	<p><i>Uterus</i>.—Accompanying and following pregnancy; associated with malignant disease, hydatids.</p> <p><i>Vagina</i>.—Vesico-vaginal fistulæ, rupture of ovarian cyst. Discharge frequently physiological, both from uterus and vagina; the quantity of water the vagina can secrete is shown in the profuse discharge after a glycerine plug is worn in it.</p>	At times colourless, or mixed with blood, and with cells of different kinds, or containing shreds of decomposing debris, or hydatids, or urine.
Mucous and epithelial, often containing epithelial debris, oil-globules. Frequently only physiological exaggeration of the normal secretion, as in pregnancy, or associated with menstruation.	<p><i>Fallopian tubes</i>. <i>Cavity of fundus uteri</i>. <i>Canal of cervix uteri</i>.</p> <p><i>External surface of cervix and the lips of the os and fundus of the vagina</i>. Seen occasionally in excess during pregnancy.</p>	<p>Whitish, alkaline, columnar epithelium; at times viscid, like unboiled white of egg; when aggravated, fills the cervix and os uteri as a tenacious plug most difficult to remove, and is quite characteristic of endometritis. It may be the cause of sterility. Where the secretion is simply increased, and attends corporeal leucorrhœa, it is known as the "whites," and is, as a rule, a proof that the general health is suffering, as in anæmia, leukæmia, and after metrorrhagia.</p> <p>Acid reaction; varies in consistence—generally thick, creamy, white, or yellowish white, adhering often closely to the os and cervix uteri, and almost membranous in character; squamous epithelial cells, oil-globules.</p>

DISCHARGES (*continued*).

CHARACTER.	SOURCE.	APPEARANCE AND PROPERTIES.
	<i>Some portion of the vagina.</i>	Acid mucus; character depends on the nature of inflammation; contains at times parasites and fungi— <i>Trichomonas vaginalis</i> ; <i>Leptothryx buccalis</i> .
Sebaceous, readily becoming purulent.	<i>Vulva, labia, vulvo-vaginal glands, sebaceous glands.</i>	Acid fatty mucus, oily particles, epithelial cells.
Purulent.	<p><i>Fallopian tubes.</i>—Pus the result of salpingitis.</p> <p><i>Uterus.</i>—Any part of the uterus, mingled with mucus.</p> <p><i>Vagina.</i>—Pus may find its way into the uterus through fistulous openings, and into the vagina either by the bursting of a suppurating cyst which has formed adhesions, or the escape of pus from a pelvic abscess, the consequence of pelvic peritonitis, or a pelvic hæmatocele. The source of this pus may be a fistulous opening from the bladder or urethra in cases of pyelitis or cystitis.</p>	<p>The appearance of the purulent secretion will, in great measure, depend on its source and the form of inflammation that has produced it; it may be profuse and thick, scanty and thin, very foetid or almost odourless, tinged with blood or rusty-looking, or of a dirty greenish colour.</p> <p>The discharge of vaginitis is, as a rule, profuse, pouring out in quantity, and, especially if it be gonorrhœal, thick, yellow, and persistent. It is mingled with epithelium.</p>
	<i>Causes.</i>	
Hæmorrhagic (excluding the hæmorrhages of pregnancy).	<p>Blood may pour from any portion of the generative tract. We may thus classify the sources of the hæmorrhage:</p> <p><i>Uterine.</i>—1. Menstrual or altered menstrual flow.</p> <p>2. In salpingitis; metritis; endometritis; glandular, granular, fungous, catarrhal cervicitis; laceration of the cervix; syphilitic disease; malignant disease; subinvolution; uterine fibroid; polypus of any kind; granulations; vascular tumours.</p>	The blood may be arterial or venous, dependent upon its cause, whether there be active or passive congestion, due to direct rupture of vessels from ulceration and slough, or their injury by laceration, or wounds of any kind. In the various morbid conditions of the blood, and during the exanthemata, the blood poured out is generally dark and does not readily

DISCHARGES (*continued*).

CHARACTER.	SOURCE.	APPEARANCE AND PROPERTIES.
Hæmorrhagic (<i>continued</i>)—	<p>3. Flexions and versions. 4. Traumatisms—operations. 5. Ectopic gestation.</p> <p><i>Vagina</i>.—Same constitutional causes as produce hæmorrhage from the vulva; granulations; abrasions; ulceration; varicose states; thrombus; traumatic causes; malignant disease.</p> <p><i>Rectum</i>.—Hæmorrhoids; congestion of the rectal mucous membrane; fissure; ulcer; malignant disease; traumatic causes.</p> <p><i>Urethræ</i>.—Caruncle, various growths, traumatisms.</p> <p><i>Vulva</i>; in the exanthemata—(variola, typhoid and typhus fevers, measles); spinal meningitis; malignant ulceration; gangrene; noma; thrombus, varicose conditions; various blood states, as in leucocythæmia and scurvy; in the hæmorrhagic diathesis; wounds, operations, coitus; from vascular excrescences, and tumours.</p>	<p>coagulate, rendering the hæmorrhage difficult of suppression.</p> <p>The blood at times is mixed with menstrual discharge, or is merely altered menstrual flow, excessive in quantity (menorrhagia); the blood is then mixed with the débris of uterine tissue, epithelial cells, fatty and oil particles, mucous corpuscles, or if there be ulceration, pus, and the products of inflammation.</p>
(2) Hæmorrhage connected with menstruation and often associated with irregularity of the menstrual periods.	1. Simple menorrhagia—physiological excess attendant upon ovulation; in plethoric states from excess of coitus; excessive menstruation at the 'change of life'—during the menopause; from suppressed skin secretion—the result of cold taken previous to or during menstruation.	
(3) Hæmorrhage due to disease elsewhere.	2. Uterine hæmorrhage dependent upon hepatic, cardiac and renal affections; in phthisical states.	

DISCHARGES (*continued*).

CHARACTER.	SOURCE.	APPEARANCE AND PROPERTIES.
Air (physometra). The air is expelled by the muscular action of the vaginal wall.	<i>Uterus and Vagina.</i> —In the knee and elbow position air enters the vagina more or less readily when the vaginal walls separate; also in the semi-prone position. Air may accumulate when a pessary is worn, if there be a fistulous communication with the bowel, or in prolapsus uteri.	

Fistula.—Most careful exploration of the vagina, uterus, and rectum is necessary in order to detect a minute fistulous communication of the vagina with the bowel, or of the uterus with either the bowel or bladder. The injection of a little milk or coloured fluid may assist in the detection.

The Microscope.—We bring the microscope to our assistance in the examination of suspicious discharges; in determining the nature of the cells contained in cysts—ovarian, hydatid, or malignant—and in hæmaturia; in cases where we suspect tuberculosis or gonorrhœa, and to clear up any doubt as to the character of inveterate discharges, a bacteriological examination should always be made. All débris removed after curettage should be carefully examined and reported upon, and the report preserved for future reference.

The Ophthalmoscope in Diagnosis.—Did space permit I might enter more fully than I am now enabled to do into the subject of ophthalmoscopic examination, in the diagnosis of uterine affections, and other diseased states which either complicate or originate the retinal disorder. It is not too much to say that every educated physician and surgeon should at least know sufficient of the ophthalmoscope to be able to diagnose an albuminuric retinitis, a hæmorrhagic infarction due to temporary retinal congestion, a choked papilla, the retinitis attendant upon diabetes, the striæ and exudation of syphilis, the disseminated choroiditis of the same disease, the retinitis of pernicious anæmia, or the leukæmic retina of anæmia and leukæmia. This practical acquaintance with the use of the

ophthalmoscope is of still greater value in the diagnosis of diseased conditions both during and after pregnancy.

It is well known how frequently some retinal extravasations are the result of secondary cardiac mischief, which has its source in vascular changes due to morbid states of the blood—as, for instance, in Bright's disease or diabetes. Most important are such ocular disturbances in pregnancy. This is obvious when we remember the effects produced on the blood by pregnancy, and the relative importance which such disturbances bear to the safety of the patient—as indications of head complications and hæmorrhagic discharges, either before, during, or after labour.

The Ophthalmoscope in Threatening Eclampsia.—L. de Wecker cites the following case:— *

‘A young American lady, twenty years of age, who was in her seventh month of pregnancy, complained that her sight had been somewhat dim during the last few days. Her husband begged me to examine her that very evening, although to do this I had to disturb a large dinner-party, which neither the condition of her sight nor health prevented her taking part in. I found that there was a very slight haziness of the retina in the neighbourhood of the papilla in both eyes, and deferred further examination till the next day. At ten o'clock the following morning the ophthalmoscope showed on the left, near the papilla, a small extravasation, which certainly could not have escaped my investigation of the previous evening. Meeting a colleague, in consultation, I informed him of the fresh hæmorrhage in the left eye and the increased haziness of the papilla, and begged him to allow premature labour to be brought on. I felt convinced that it would not be long before serious brain symptoms would declare themselves, and that in any case this primipara would not arrive at her full time without some accident. One of the most celebrated accoucheurs in Paris was called in further consultation, but I was unable to convince him of the danger. During the night which followed this consultation—that is to say, four days after the first ophthalmic examination—the patient was seized with convulsions, following each other in rapid succession. In all haste Dr. Campbell was sent for, but he did not feel justified in forcibly delivering a patient who lay unconscious and in a moribund condition. Death occurred the following night.’

There can be little doubt that at least 10 per cent. of cases of Bright's disease suffer from retinal complications. This is placing the number at a low figure.

A primipara, aged 26, in the fifth month of pregnancy, consulted me for ocular symptoms—twitching of the eyelids, dimness of vision, some pain

* ‘Ocular Therapeutics,’ trans. by Litton Forbes.

and frontal ache. There was some 50 per cent. of albumen in the urine. The papillæ were hyperæmic, and there was a surrounding haziness. Labour was induced the following day at 3.30 p.m., convulsions beginning at 11 p.m. The uterus was emptied at 1 p.m., an adherent placenta giving some trouble. The patient was kept under chloroform from 11 p.m. until 2.30 the following day, convulsions recurring on any withdrawal of the anæsthetic. A subcutaneous injection of one-tenth of a grain of nitrate of pilocarpine was then administered, producing rapidly its full physiological effects, after which the convulsions ceased, and the patient made an excellent recovery.

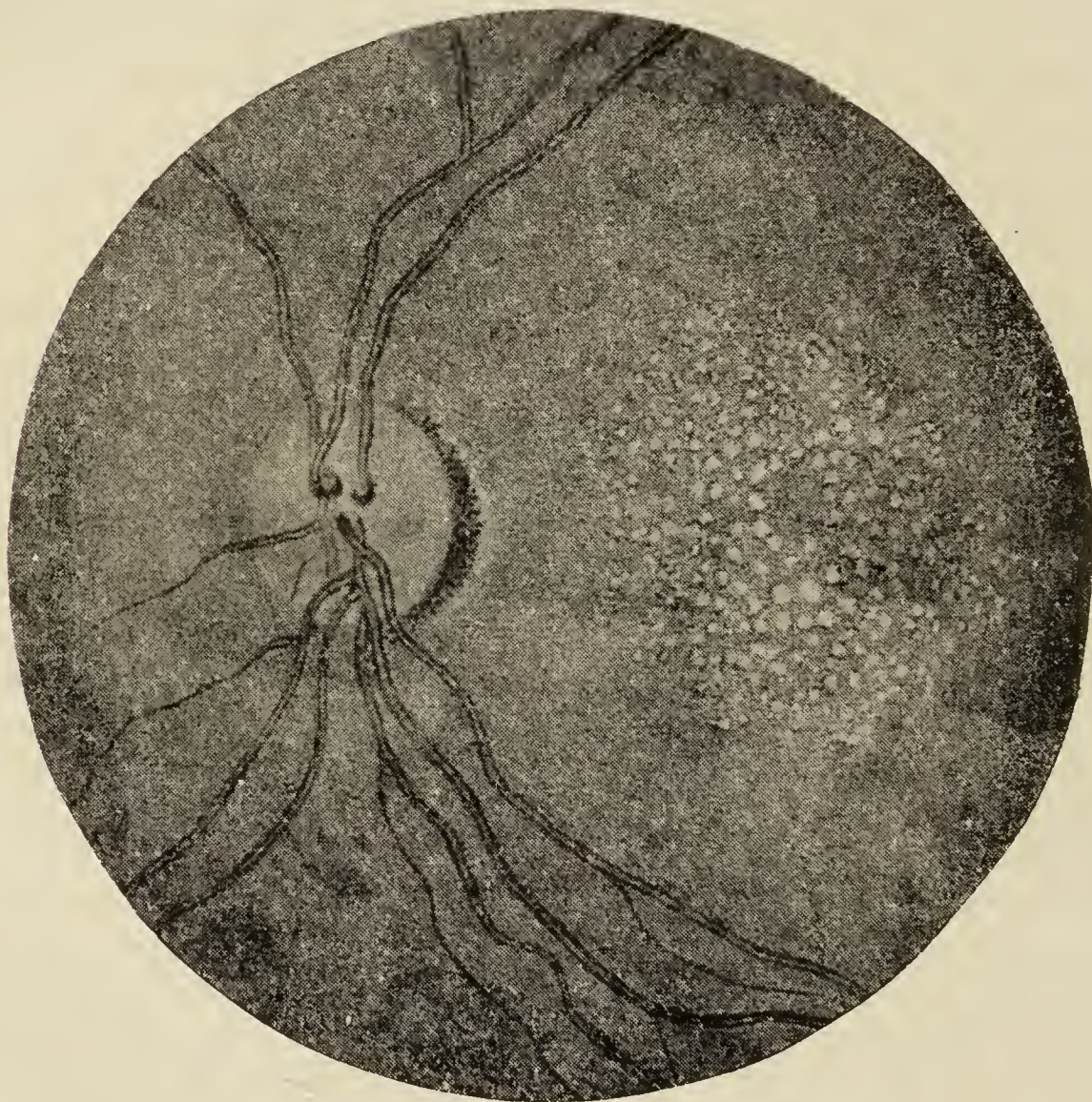


FIG. 77.—CENTRAL CHOROIDO-RETINITIS. APPEARANCE OF THE LEFT FUNDUS FOLLOWING UPON PARTURITION AND SEVERE POST-PARTUM HÆMORRHAGE.

The papilla is partially atrophied. The group of white dots is seen in the region of the macula. Here also were some remains of hæmorrhagic infarctions. The group of dots was quite distinct from uræmic patches. It corresponds with the retinitis guttata of Nettleship. This patient died four years subsequently of uræmic and other complications (p. 103).

Were the use and knowledge of ophthalmoscopy generally insisted on, many diseases would be more frequently recognized in their earlier stages, and a timely warning given. In noticing L. de Wecker's allusion to the contra-indication of hot baths in retinal lesions dependent upon nephritis, I am reminded of three cases of sudden death occurring within my own

experience which were caused in this manner. One instance was that of a lady who noticed that her vision was affected for a few days, and called on me to have an examination made. I happened to be absent. She left word that she would come the next day. That night she took a hot bath, which she had frequently taken before, was attacked while in the bath, and died in a few hours of apoplexy. An ophthalmoscopic examination that day might have saved her life.

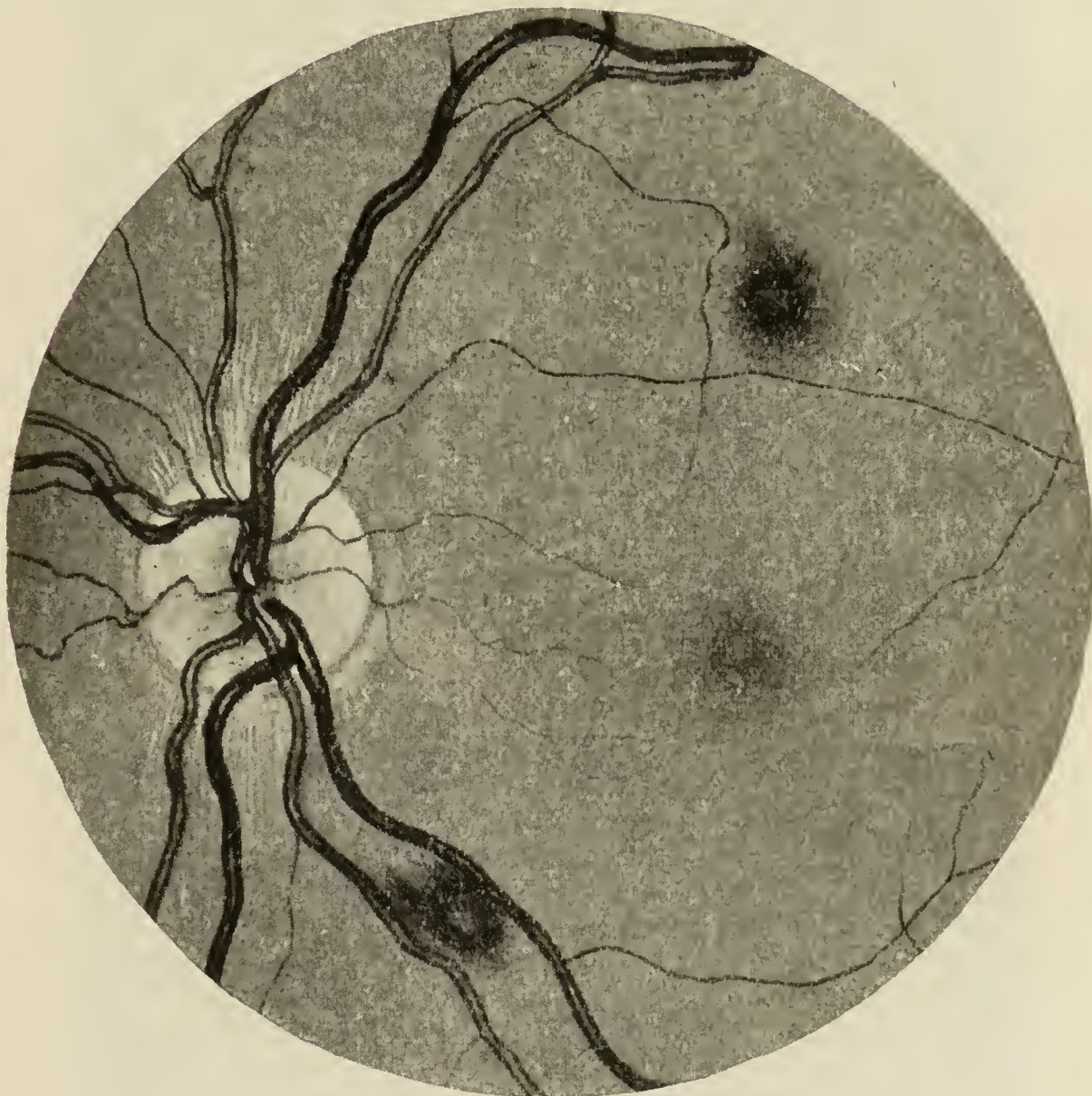


FIG. 78.—HÆMORRHAGIC INFARCTIONS FOLLOWING ON ALBUMINURIC RETINITIS DURING PREGNANCY.

V restored both eyes to $\frac{6}{3}$.

A patient from whom I removed the adnexa with a parovarian cyst, subsequently conceived, and suffered during her pregnancy from albuminuric retinitis. Sudden hæmorrhage occurred into the retinae of both eyes. From this she became practically blind. The extravasation, however, gradually disappeared after her delivery at full term. The drawing was taken during the time of convalescence (Fig. 78).

I could multiply instances in which both the detection and diagnosis of existing disease have been due to the ophthalmoscope. 'The retinitis of malignant anæmia is so constant,' says L. de Wecker, 'that it may be looked on as pathognomonic.'

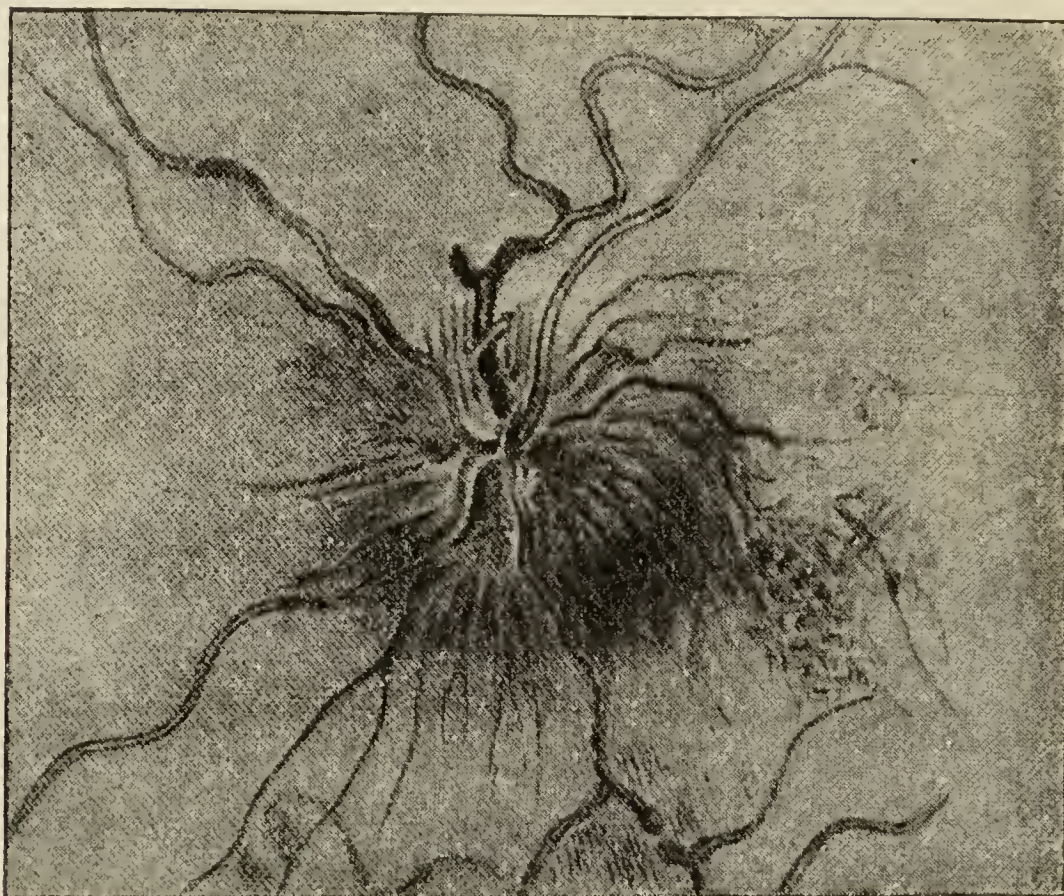


FIG. 79.—CHOKED OPTIC PAPILLA OF A PATIENT, OCCURRING DURING SUPPRESSION OF THE CATAMENIA.

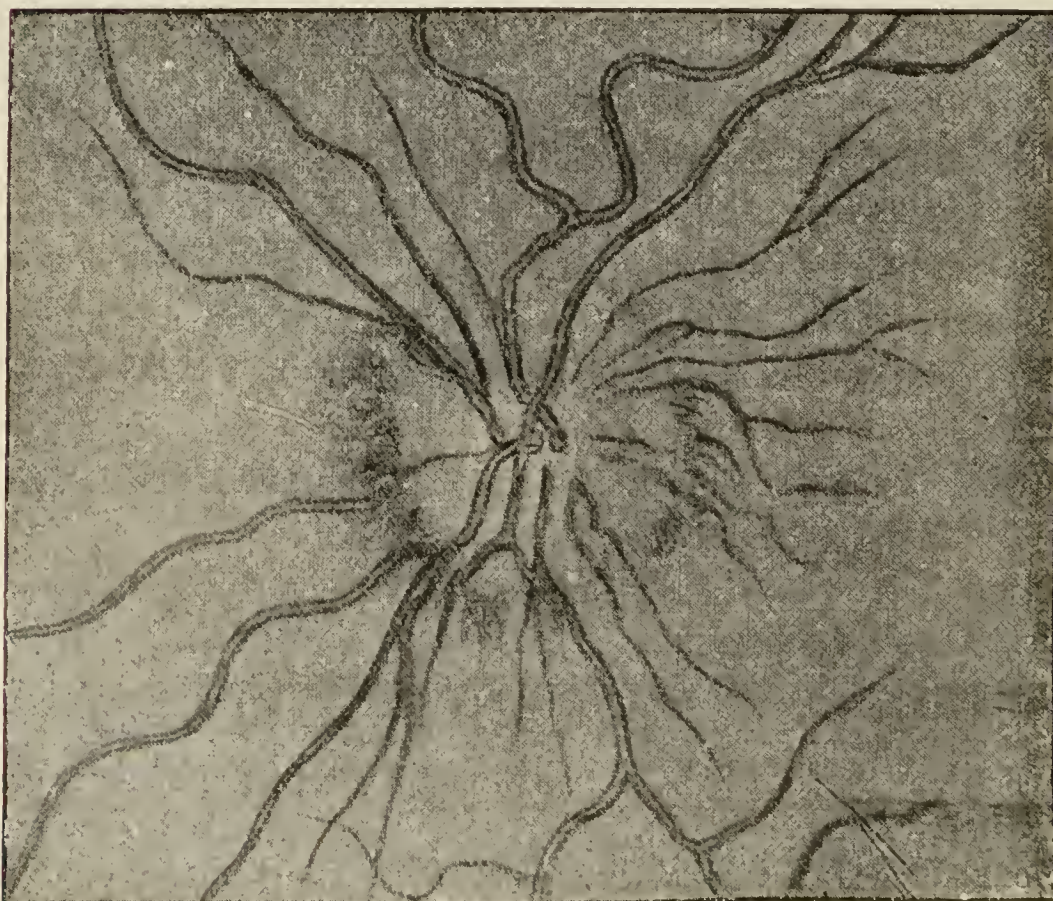


FIG. 80.—SAME PAPILLA WHEN RECOVERING.

Treatment locally, instillation of pilocarpine and eserine (physostigmine); and internally, ergot and iodide of potassium.

The patient from whom the drawing (Fig. 77) was taken never had had any affection of the eye before parturition. Three days after her labour very severe post-partum hæmorrhage occurred, and she found the vision of the right eye defective. She was sent to me by Dr. Wm. Slimon six weeks after labour. The vision then was reduced to the counting of fingers at a distance of 5 feet. The entire region of the macula was dotted over with white dots. It presented much the look of a retina suffering from Tay's 'choroiditis guttata' (centralis), or the spots of 'disseminated choroiditis' which has been described by various authors.

In this case there had been no albuminuria during pregnancy. The vision was suddenly affected, and the appearances are quite distinct from those seen in the retinitis albuminuria of pregnancy and Bright's disease. It would appear that there was after the labour some infarction of the retinal vessels following on the severe uterine hæmorrhage, and that possibly a state of thrombosis was induced. This set up an irritation in the region of the macula, which was followed by the peculiar exudation. The exact nature of these dots is not understood. Hutchinson believes them to be colloidal.

I have known women whose symptoms were ascribed to amenorrhœa, hysteria, anæmia, a disorder of pregnancy, a dyspeptic state, gastric disturbance, or liver derangement, in whom an ophthalmoscopic examination and the discovery of optic neuritis, choked disc, detached retina, retinal apoplexy, pulsating vessels, Bright's degeneration, or syphilitic effusion, would have afforded a clue to a correct diagnosis.

Consequences of Eye-strain in Women.—I would here draw attention to a most important complication which will be found in a certain proportion of patients who consult us for female disorders. I refer to eye-strain, with all its consequences on the nervous system. This eye-strain, due to errors of refraction, is often followed by such symptoms as headache, difficulty of thought concentration, nausea, and neuralgia. Even epileptic seizures have been proved to have their origin in an uncorrected astigmatism. These effects are especially accentuated in many women prior to, and during, menstruation. Naturally, they are more felt in the instance of a neurasthenic woman who is suffering from the dual trouble of the refractive error and some menstrual aberration. Hence we find them frequently present at puberty, during pregnancy, and in the climacteric. This association is specially worthy of the attention of the gynæcologist, as not infrequently disorders of the pelvic viscera are present.

In the chapters on 'Uterine Neuroses' sufficient evidence will be found of the concurrent occurrence of aberration of function in the generative organs with disturbance of the brain or cranial nerves.

At the annual meeting of the British Medical Association, 1895, I read a paper in the Ophthalmological Section on this subject, pointing out that in the unstable state of nervous excitability or irritability, to which women suffering from pelvic disease are liable, there is a predisposition to central effects of possibly slight peripheral ailments. I then gave the particulars of fifty cases of women of various ages who consulted me within a comparatively short time, most of whom suffered from some form of pelvic disorder, and in whom the symptoms above referred to were present. *Not one of these patients attributed any of the symptoms to a visual defect, yet in all there were varying degrees of astigmatism*, in the great majority relief from the head symptoms following on the correction of the refraction by suitable lenses.

Headache the result of Eye-strain.

A few cases are sufficient to illustrate the point I desire to emphasize—viz. that in women who suffer from such symptoms as headache, nausea, mental fatigue, and difficulty in concentration of thought, errors of refraction should be sought for as part of the general treatment of the case:—

A young lady, aged twenty-two, a proficient musician, suffered from various local and other symptoms, which, upon examination, were found to be due to retroversion of the uterus. Attendant upon these was constant and severe headache. This, it was hoped, would disappear with the rectification of the displacement. She was advised to consult me as to the need for continuing to wear the support. This she did, complaining at the same time of the continuance of very bad headaches, though she had recovered from her other local troubles. On examining the eyes, I found that she had myopic astigmatism, which had never been corrected, as she was wearing simple spherical glasses for all work. With -0.75 cyl. added to her spherical lenses, this was completely corrected, and when last I saw her, her headaches had ceased.

Mrs. —, aged forty-six, had suffered from severe headaches on and off for years. She was now in the menopause, with irregular catamenia. Her headaches had of late become much worse. Further than an enlarged uterus, with some tenderness, there was no pelvic trouble. She had never suspected her eyes as a cause of her headaches. Several teeth were carious; these were removed. On examination, I found hyperopic astigmatism, which was completely corrected. When I last heard of her, about one month after wearing the glasses, her headaches had completely disappeared.

Mrs. H—, aged forty, consulted me for general ill-health, including metrorrhagia and other pelvic symptoms. She had as violent head pain as I have ever known of. All the teeth in the upper jaw, being carious, had been extracted for this latter symptom, without affording relief. She had a uterine cervical erosion and endometritis. She was cured of these latter troubles, but the head symptoms continued. On examination of the eyes, I

found myopic astigmatism of the right, and hyperopic of the left eye: -2.5 cyl. (vertical) in the right eye, $+0.25$ spher. and $+0.25$ cyl. (horizontal) in the left eye, brought her to nearly $\frac{6}{6}$. She has been completely relieved. Careful attention in all cases was paid to any attendant asthenopia, and any errors of insufficiency were corrected by prisms.

Exploratory Incision.—Having exhausted all our means of diagnosis, and doubt still remaining, in a case of abdominal tumour, where the question of operation arises, there is yet abdominal exploration. This step is not to be resorted to save as a *dernier ressort*, as in itself it is not devoid of danger. Every antiseptic precaution is taken before and during the exploration. A small incision is made through the skin over the linea alba. The knife is carried on carefully through the cellular tissue, fat, tendinous structures, and subperitoneal tissue. All bleeding is arrested by torsion or ligature. The peritoneum is now examined. The shining wall of an ovarian cyst may be seen lying underneath. The peritoneum is next carefully raised by a tenaculum, or caught up in a fine forceps, and a small opening made which is enlarged on a director for the extent of an inch and a half to two inches. We are thus, with two fingers, enabled to examine an adjacent cyst-wall, search for adhesions, or explore the abdominal cavity.

Examination of the Rectum.—When the rectum has to be

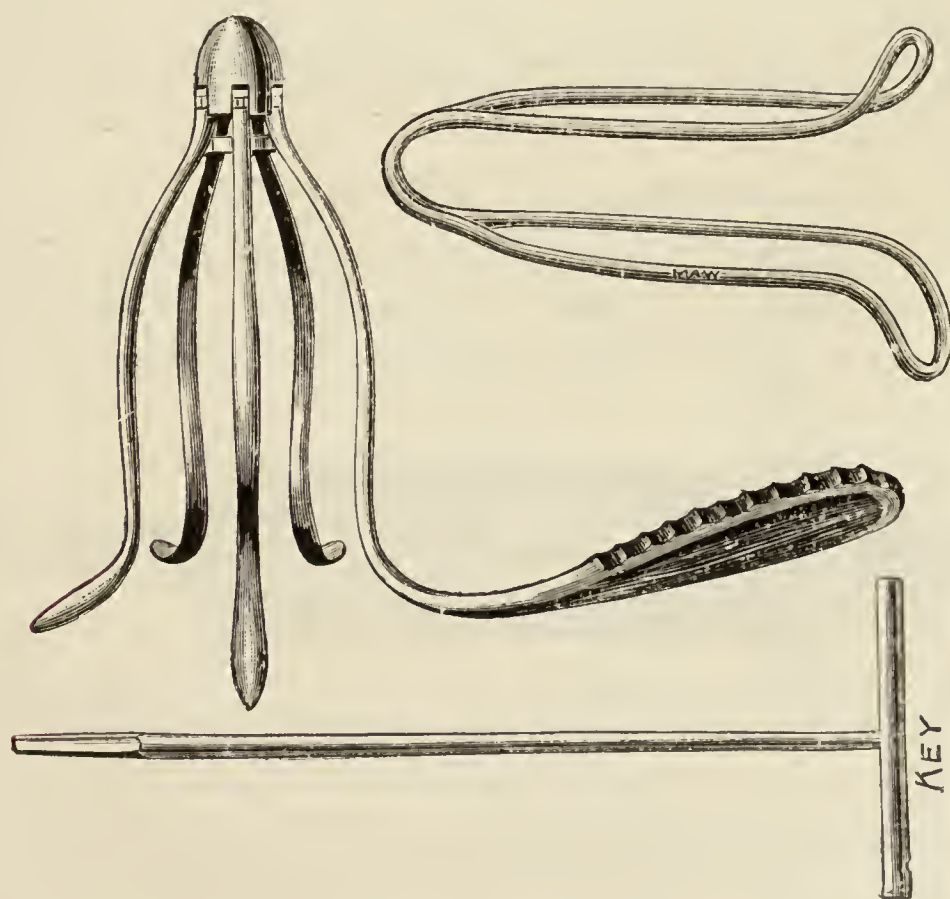


FIG. 81.—RYALL'S EXPANDING RECTAL SPECULUM.

FIG. 82.—RECTAL SPECULUM.
(DAVY'S.)

examined for fistulæ, fissures, ulcers or hæmorrhoids, we may require

a speculum (Figs. 81, 83). As a rule, the educated finger of the surgeon who is familiar with the feeling conveyed by the margins and roughness of an ulcer, the internal aperture of a fistula, the ridge and sharp sulcus of a fissure, the contraction of a stricture, the hardness and irregular surface, often easily bleeding, of malignant disease, gives the most reliable and certain information. The patient is placed on the couch, the nates are drawn well to the edge, and the thighs flexed.

I seldom use any rectal speculum. I show three which are in common use—those of Ryall, Gowland, and Davy. Ryall's rectal speculum is an ingenious instrument. I refer to it in the chapter on the 'Rectum.'

Proctoscopy.—Kelly practises proctoscopy by means of the proctoscope—a rectal speculum protected by an obturator. The light from an electric lamp is cast into this from a forehead mirror. The buttocks of the patient,

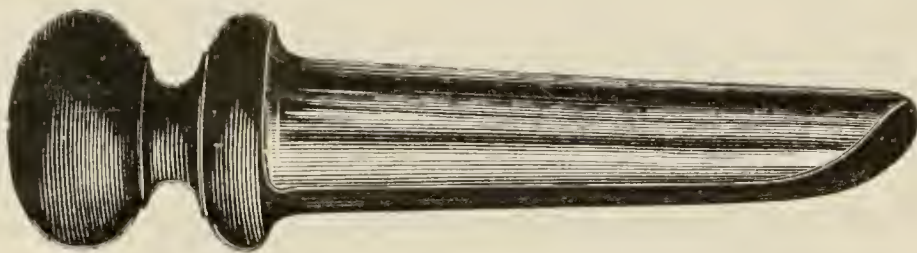


FIG. 83.—RECTAL SPECULUM. (GOWLAND'S.)

who is in the knee-elbow posture, are placed against uprights, to which the thighs are fixed, and thus the surface of the mucous membrane is inspected. (See chapter on 'Rectum' for the illustration of Howard Kelly's method.)

Examination of the Urethra.*

To explore the urethra, I employ my dilators (Fig. 68). Gradual dilatation can be finally completed with the finger. If nothing else be at hand, a small glove-stretcher may be used. Howard Kelly's

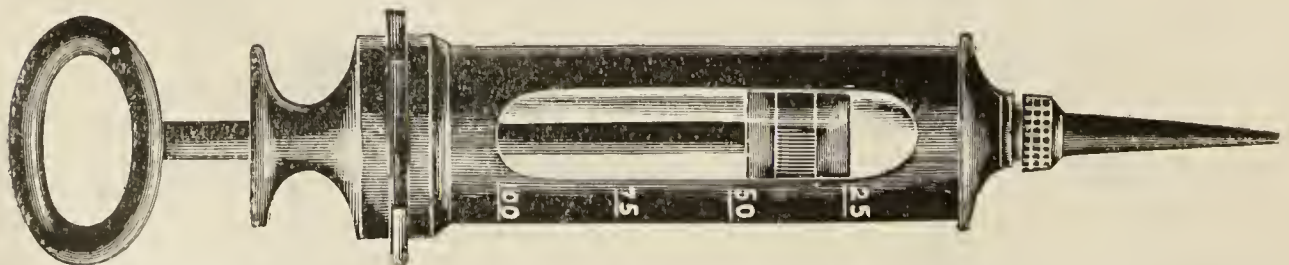


FIG. 84.—VULCANITE AND GLASS SYRINGE FOR UTERINE AND BLADDER INJECTIONS.

method of examination of the bladder and ureters (as also Kölliker's), by the cystoscope, are described in the chapters on the 'Bladder and Ureters.'

* See chapter, 'Anatomical and Clinical.'

CHAPTER IV.

ASEPSIS AND ANTISEPSIS IN GYNÆCOLOGICAL SURGERY.

WITH regard to hospital methods for securing asepsis, there can be no possible excuse for even the slightest defect in any of the details of aseptic surgery. Here economy has seldom to be considered. In his theatre, appliances and assistance, both before, during, and after operations, the surgeon is amply provided for; and it is simply unpardonable if any accident occurs which can by possibility be traced to a flaw in the methods.

It is, therefore, rather with a view to insisting on the need for caution *outside* the hospital operating theatre and ward that I write this short summary of the methods that I myself pursue. I have not the least doubt that there is still, even with all our knowledge of the vital importance of asepsis, a great deal of inexcusable negligence in the manner in which this first essential of the modern surgical art is achieved; in short, there is much that is casual in the manner in which preparations are made, and the regard that is placed on such precautions. Possibly this may arise from the fact that though in a misty sort of way the need for them is recognized, it has only been of recent years that the profession generally has begun to realize their vital necessity. This observation applies to surgeon and nurse alike. Looseness in the education of both has generated a corresponding laxity in their ideas as to how complete asepsis is to be maintained; and we are now in that transition stage between the older practices of simple antiseptics, often indifferently carried out, and the far more scientific and correspondingly difficult aseptic procedures of the present day. Those educated under the old plan find it difficult to adapt their surgery to the demands of the latter, nor in some respects can we blame them, when we still find responsible teachers and operators who speak slightly of the unnecessary refinement of care with which the majority of modern surgeons strive at asepsis.

Convinced of the extreme importance of exact attention to the minute details as well as to the general principles of asepsis and antisepsis, my object is to lay down precise rules, based on my own experience and that of others, to be observed in the arrangements of the operating-room, the preparation of the patient, the operator, and his assistants, and the care of instruments, dressings, and other appliances, dealing with the matter more especially from the point of view of the abdominal surgeon and gynæcologist. And in order to make these observations as practical and useful as possible, I shall enter into the question of the installation of a private operating-room with everything that is essential to the purpose.

I am in perfect agreement with the views of Doyen* that 'when we lose a patient who has been operated upon, the most common cause of death is infection within the operative tract,' an infection facilitated by the reduction of the vital resistance brought about in enfeebled and in cachectic subjects, particularly among the cancerous. A pretension to infallibility in asepsis is as ridiculous as it is dangerous. Even in cases where complications occur at a distance from the field of operation, such as bronchitis, pneumonia, phlebitis, etc., it is rarely found that they arise from any cause save as the direct consequence of interference. 'If the patient should succumb,' says Doyen, 'carefully study the probable causes of death, and question your memory on the minutest details,' and he goes on to remark that to an interference, out of all proportion to the vital resistance of the patient, which has been too prolonged, or to infection alone, we may often ascribe the fatal issue, and still more frequently to both causes combined. This conclusion he says he has come to as the result of many years of experience, acquired in the service of various hospitals in which bacteriological observations of the most searching kind were conducted as to the causes of death after operations.

This fact has always to be remembered by those who profess to ignore strict asepsis in their operations—that no matter how brilliant their results may be, if they have lost a single case through neglect of aseptic and antiseptic precautions, they have dearly paid for their antagonism to the almost universal practice of the day.

Some may consider that certain details are carried to extremes in the Continental and American *kliniks*. I do not think so. There may be limits to our possibilities in private 'homes' and houses, but

* Doyen's 'Technique Chirurgicale' (Paris: Masson and Co., 120, Boulevard St. Germain).

there are no such limiting conditions in our hospitals. Far better this attention to the minutest details, than that the entire system should be rendered ridiculous by glaring oversights on the part of operator, assistants, and nurses, in the handling and transferring of instruments, ligatures, and sutures, in the casual exposure of these to sources of infection before and during operative manipulations, and by other faults of omission and commission. Such errors justly brought severe criticism on our British antiseptic methods—criticism which cannot be answered. This should not be so in the birth-place of antiseptic surgery. Call it by whatever name we may, the surgical world, in the twentieth century, with such few exceptions that they seem only to prove the rule, has accepted the teachings of Lister, and the universality of that acceptance, as well as the results of the adoption of those teachings, are unanswerable testimonies to their truth. No theory in the history of medicine has been subjected to more universal, more crucial tests, by observation or experiment, than that of the germ theory in wounds, in relation to septic changes in these. The practical result has been the universal adoption of aseptic surgery, and no department of the surgical art has benefited more by the use of antiseptic and aseptic methods than that of gynæcology.

The directions here given for the conduct of aseptic preparations, and the completion of a thoroughly aseptic operation, are written after visits to the *Frauen-Kliniks* of Martin, Olshausen, and the Landaus in Berlin; of Schauta in Vienna; the *cliniques* of Terrier and Hartmann at the *Hôpital Bichat* and that of the installation of Doyen in Paris; Säger and Kleinhans in Prague; Winckel and Gustav Klein in Munich; Paul Zweifel, and Krönig and Menge in Leipzig; Leopold in Dresden; Bumm in Halle.

‘Asepsis’ and ‘Antisepsis.’—The differentiation of the terms ‘antisepsis’ and ‘asepsis’ is hardly understood. The need for separating into two distinct categories septic and aseptic operations is not fully appreciated or realized, either by surgeons or nurses. Antisepsis before, and asepsis during, an operation, should be secured by methodical and systematic precautions never departed from. This is an invariable rule.

It is no infrequent occurrence for a nurse to constantly assure the surgeon that she is thoroughly versed in both antiseptic and aseptic methods, and yet to find that when she is subjected to the practical test of attendance upon an operation and attention to a case, she is deficient in many of the first principles of her work. There can be only one standard for the hospital surgeon on the one hand, and

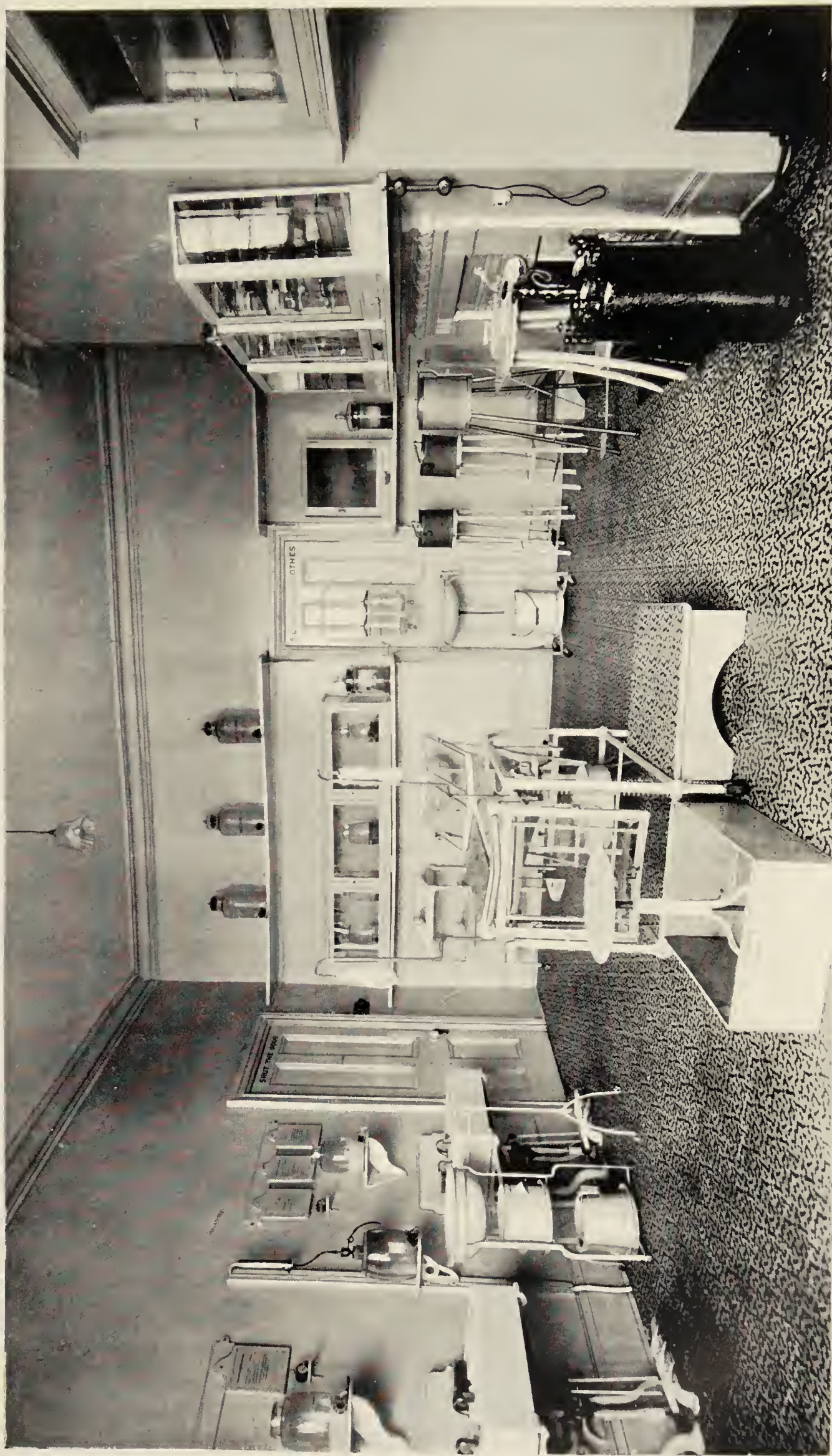
the practitioner or surgeon who operates in the private 'home' or house on the other; and though the latter may not be able to achieve that degree of perfection which should always be at the command of the former, still he must strive, so far as it is within his means and possibilities, to do so. Fortunately, in consequence of all the recently constructed appliances which render it easy for the surgeon to carry with him, without danger of contamination from any outside source, all his sterilized instruments, dressings, compresses, and sponges, as well as his various ligatures—and not only these, but also the sterilized nail-brushes, antiseptic soap, and the overalls for himself and assistants—the operator can reduce his risk of failure in detail to a minimum. And there is no longer any excuse that can be advanced, either on the part of those who have to prepare for an operation or of the operator, for subjecting the person whose life he is taking in his hands to an unnecessary risk, for the incurring of which there can be but two explanations—ignorance or negligence.

It may not, then, be without advantage to emphasize what true antisepsis and asepsis really mean. By *asepsis* I understand an absence of all septic organisms. This condition is secured by certain methods which have relation to the sterilization of the hands of the operator, assistants, and nurses; of the area of operation before, during, and after surgical intervention; and the instruments, sutures, sponges, dressings, and other appliances employed. When no pathogenic organisms are present, the condition is one of asepsis.

By *antisepsis* I understand any or all of the methods by which such absence of septic germs is obtained. These methods will therefore include disinfection by hot air, steam, boiling water, and the use of the various chemical germicides that destroy or render inactive the pathogenic organisms.

For many years a condition of perfect asepsis in operations has been the ideal of surgeons. It is hardly too much to say that even at the present day the best results obtained are only an approximation in the direction of that ideal. But of this we may rest assured, that the nearer we come to its realization, the nearer, also, we shall attain to the elimination of all preventable morbidity and mortality after operations.

A fundamental difficulty in the securing of perfect asepsis lies in the fact that various organisms, some of them pathogenic, are constantly present in the skin, in the digestive canal, and in the female genital passages up to the os uteri internum; of those inhabiting the skin, at least one organism, the



OPERATING THEATRE (ST. RONAN'S').

Showing table; pedal sinks (with jars containing lysoform); over these small clocks, to time sterilization of hands and arms according to instructions suspended over the sinks; Pasteur's filter; lavabos; pedal baskets for dressings, compresses, and dabs; sterilizer for moist dressings, etc.

PLATE VIII.



ANOTHER VIEW OF SAME THEATRE.

With second table to the left (Greig Smith's); sterilizers, etc.; also transformer for cautery, and lavabo for douching and holding artificial serum.
(See p. 112, Figs. 85, 86.)

Staphylococcus pyogenes albus (*Staphylococcus epidermis albus*, Welch), lies deeply in the epidermis, or hair follicles, beyond the reach of any antiseptics. On the other hand, it is to be remembered that infection depends not only on the presence of a germ, but also on the weakening of the resistance of the tissues; consequently, with favourable circumstances, an organism, otherwise pathogenic, may be in fact inert, so that, as Howard Kelly truly says, 'a fresh wound containing these organisms may, from a surgical standpoint, be considered as aseptic when the process of healing is in no way interfered with.'

The Operating-room.—My object being, as I have said, to dwell rather on the necessity that exists *outside* a public hospital for the adoption of as complete asepsis and antisepsis as may be secured, I desire to show how a small private operating-room can be constructed at a comparatively small cost, and, though not as perfect as the theatre of a hospital, can still, so far as the materials for asepsis and antisepsis are concerned, be brought as near to perfection as can be hoped for with the means at our disposal.

The room selected must be well lighted and well ventilated. The best window is a sloping skylight facing the north. The floor may be composed of square encaustic tiles, or of a well-laid parquet flooring thoroughly saturated with wax, and highly polished. A more economical plan is to have the floor cemented; or, as a still cheaper expedient, a highly glazed through and through linoleum may be used. The skirting of the floor all round the linoleum must be kept dust free by a triangular piece of teek fitting accurately to the wall. In any case, the floor should be well washed daily, and scrubbed once or twice a week. On the walls and ceilings there should be no ornamentation or projections; and it is an advantage to have all angles rounded off. The material of the walls should be a hard smooth cement, coated with some kind of enamel.* All walls and shelves should be prepared with this.

For artificial illumination electric light answers best. Where there is no electric installation the incandescent gas-burner can be availed of. One good light should be placed just above the operating-table, as shown in the place. It should be of 50-candle power, and contained in a reflector. The one in my theatre is thus intensified so as to give a light of 150-candle power. This light should be suspended by weight and pulley, and worked on a universal crank so as to turn at any angle. A second bull's-eye light on a lever stand, to be raised or lowered at pleasure, and to

* For this purpose a beautiful 'lacquered paint' is made by Messrs. Flicoteaux, 83, Rue de Bac, Paris, which gives a porcelain surface, is capable of being scratched without detriment, and is thoroughly aseptic.

work at any angle (see Fig. 86) can be connected by a plug and cord with any fitting.

Hot and cold water should be laid on; porcelain sinks are the best, and the taps should be turned, and the waste plug lifted, by pedal arrangement. In addition, one or two portable lavabos are required for rinsing and disinfecting the hands during an operation.

Plenty of sterilized water should always be available. Without special apparatus this can only be obtained by boiling water for half an hour and allowing it to stand in covered vessels for a longer or shorter time according to the temperature required. A

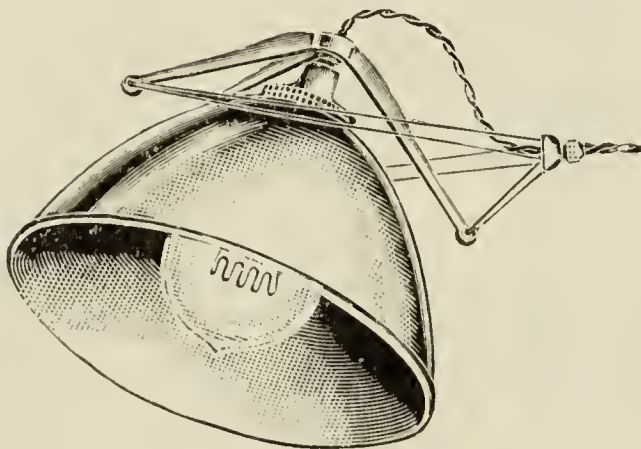


FIG. 85.—ELECTRIC LAMP WITH REFLECTOR (150 CANDLE).

Can be adjusted to any angle. It is suspended by a pulley over the operating table.

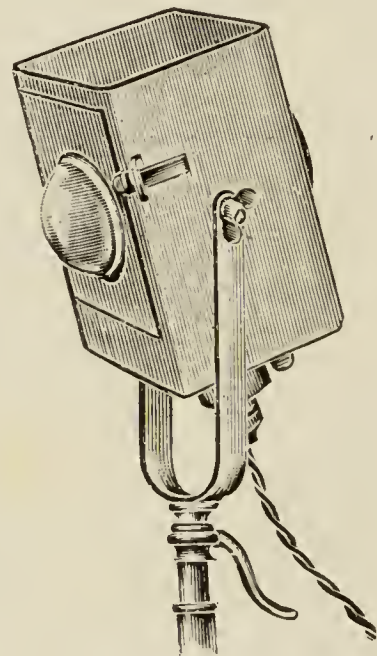


FIG. 86.—STANDARD LAMP WITH BULL'S-EYE REFLECTOR (50 CANDLE).

Can be quickly raised or lowered and adjusted at any angle.

“Geiser” is useful for the purpose in a room adjacent to the theatre. Or if large quantities are likely to be used, a special apparatus, such as a copper reservoir lined with a steam coil connected with a boiler, is required.

Private Installation.—1. I may here describe my own installation at the “home” in which I operate. The room was thoroughly prepared for the porcelain paint to which I have referred, with which it and the doors leading to it were entirely covered. All the shelves have the same coating. A cupboard off the room is used for the surgeon's clothes, overalls, jackets, aprons, small blankets for the patient, and various bandages.

Directly over the table is suspended an electric lamp with reflector, capable of throwing a 150-candle light on to the patient. This is readily raised or lowered by pulley action. The room is

otherwise lighted by electricity. It contains the vapour and dry sterilizers, and a boiler, used for the supply of hot water, and a Chamberland-Pasteur filter. In it are also the movable *lavabos*, which can be readily rolled from place to place. One contains sterilized water for douching, and the litre-marked funnel jar for

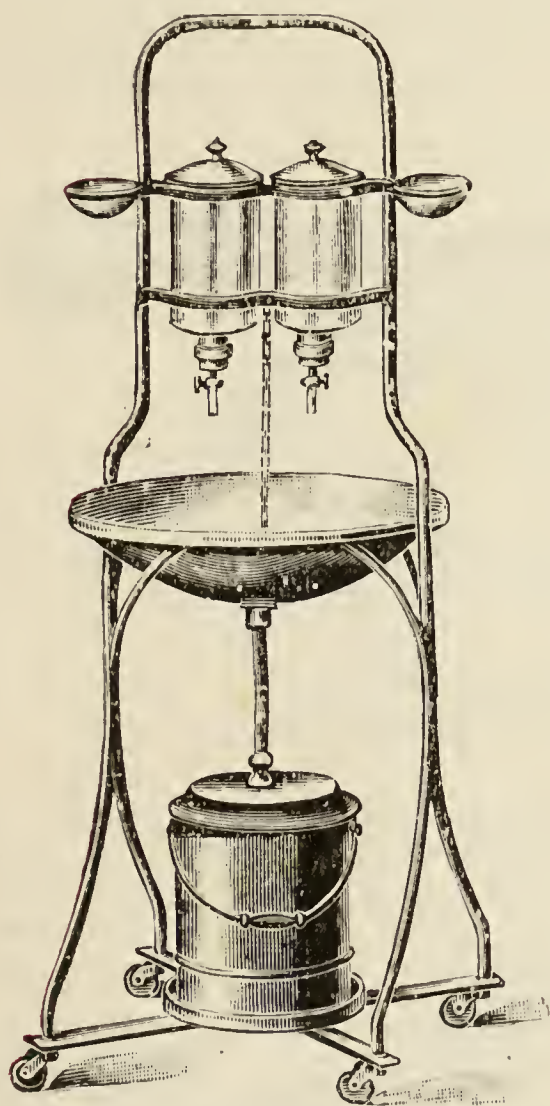


FIG. 87.—MOVABLE LAVABO (No. 3).

The jars contain (1) absolute alcohol and solution of perchloride of mercury equal parts; (2) lysoform solution 1 per cent.

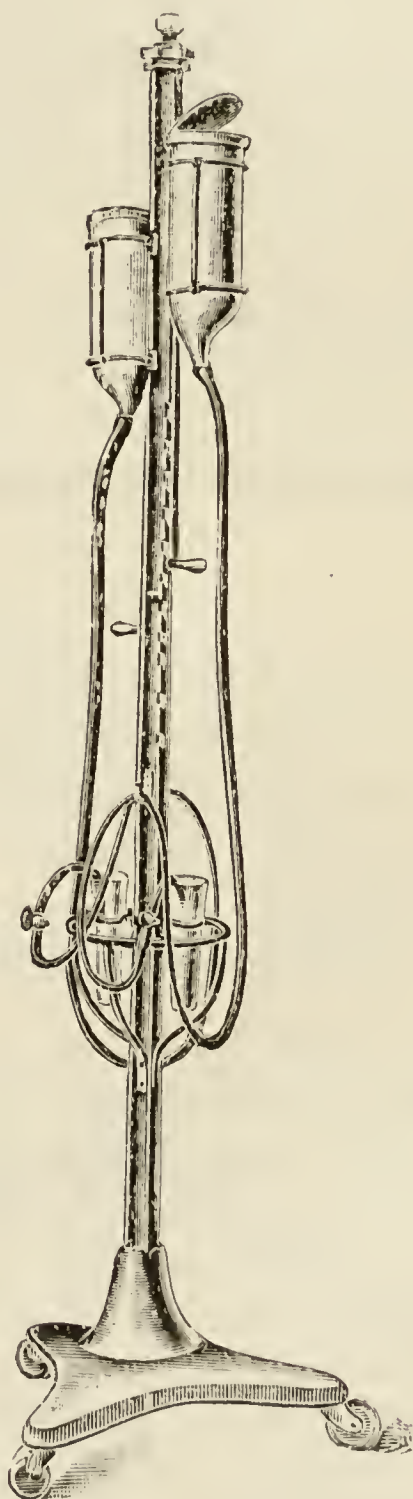


FIG. 88.—LAVABO (No. 1), FOR ARTIFICIAL SERUM, AND DOUCHE.

the use of sterilized serum, should such be required in emergency during or immediately after operation. This serum is made by adding 7 parts of chloride of sodium to the 1000, and the needle used is that shown in Fig. 89. This is introduced into the subcutaneous tissue under the mammary gland, and about a litre of the

fluid is allowed to flow subcutaneously in cases of threatened collapse from hæmorrhage or shock. The serum should be sterilized at 130° , and injected subcutaneously in a dose of from 50 to 200 grammes as often as twice or three times in the day, or even more frequently in grave cases.

Two glass tables hold the trays for the instruments used in operating, and boxes containing the various sutures and ligatures. The second assistant, standing near the operator, has this stand at his side. He hands all the instruments as they are required, as well as the ligatures, cut straight from the reels, and threads the needles. Another small lavabo, placed behind and to the side of the operator, contains lysoform or lysol for cleansing the hands during operation.



FIG. 89.—NEEDLE FOR ARTIFICIAL SERUM.

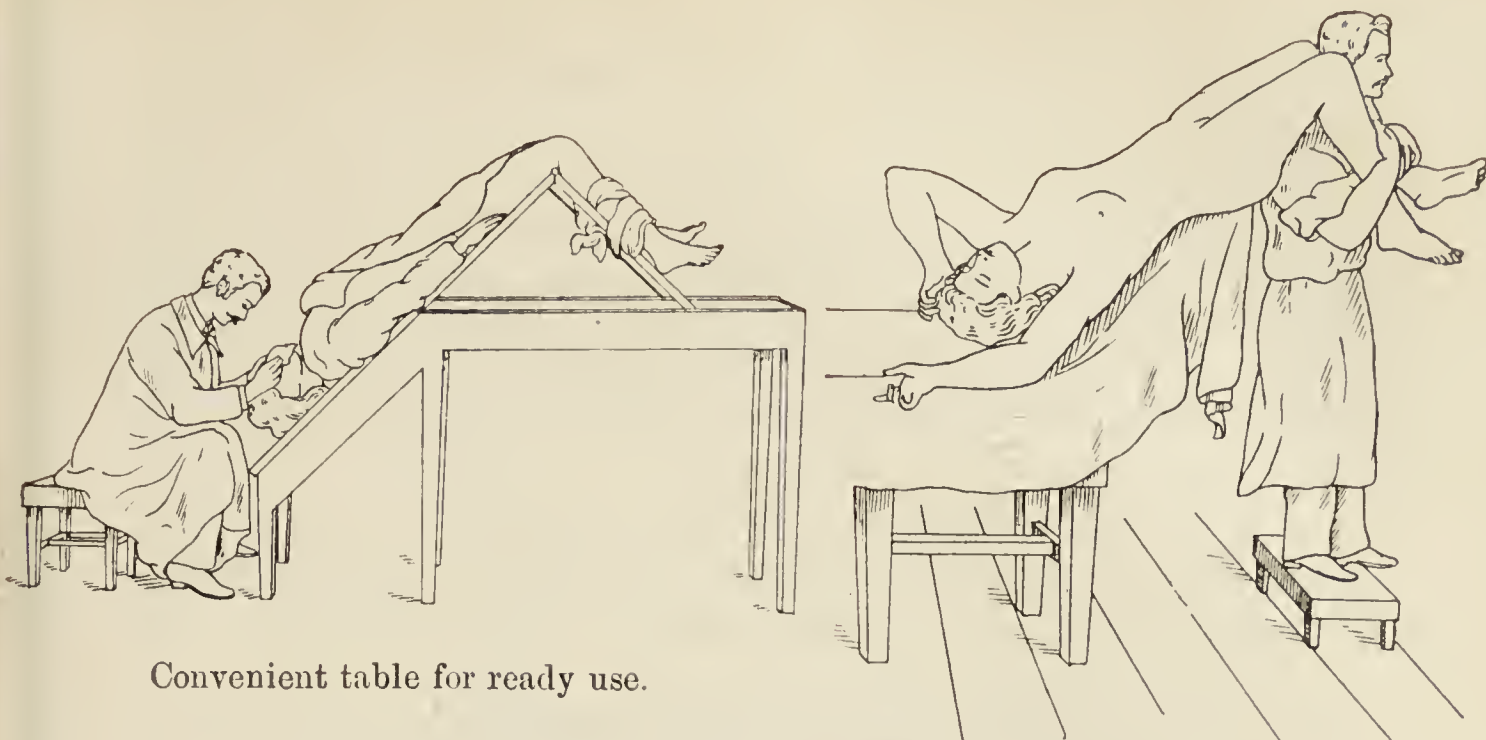
I am in the habit of burning a formalin lamp, the "*Alformant*," in the room for several hours the evening before operation, and the same means is used to disinfect the closet in which the clothes are kept.*

Operations performed in a Private House.

From what I have said I think it is manifest that, with the facilities we now possess of carrying about with us in a properly constructed bag everything perfectly sterilized that can by any possibility be required for an operation, if we have an intelligent assistant, conversant with the aseptic methods, we can fulfil most of the conditions that are demanded of us. Clearing a room of all superfluous furniture and draperies, as well as carpets, or other sources of infection, we can in a few hours have all the woodwork thoroughly scrubbed, and the room disinfected. The *Alformant* lamp (Fig. 108) enables us to do this, without injury to any surrounding materials, within a period of twelve hours.

Perhaps the most dangerous element in an operating-room is the uneducated or careless nurse. We are more likely to have to face

* This lamp, with the tablets for burning in it, can be had of the Formalin Hygienic Company. For air-sterilization, 1 tablet in 1000 cubic feet; for disinfection, 10 tablets in 1000 cubic feet. It is capable of diffusing 20 to 25 tablets of dry formalin at a time.



Convenient table for ready use.

An assistant keeping the patient in the Trendelenburg position.

FIG. 90.—THE TRENDELENBURG POSITION. (POZZI AND JAYLE.)

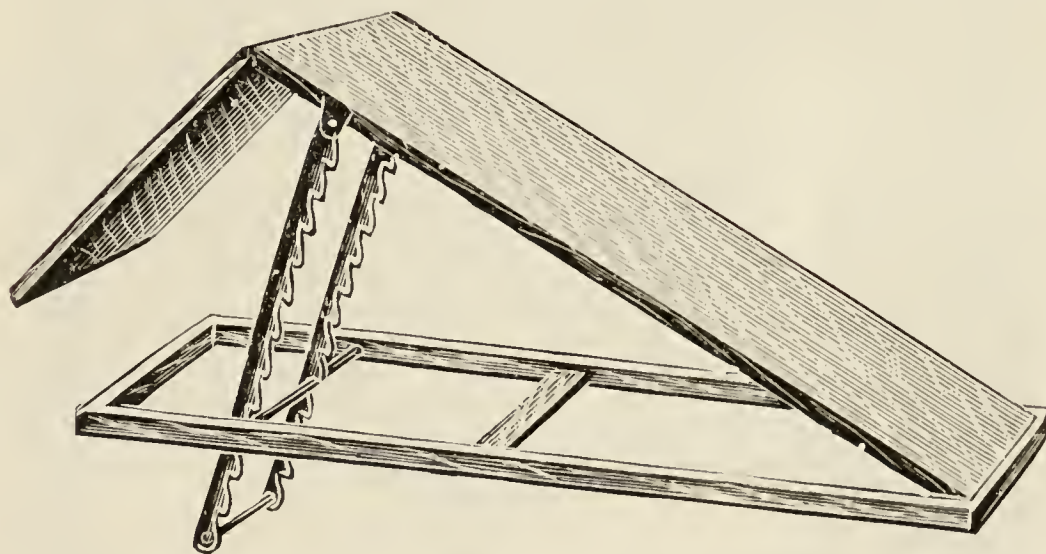
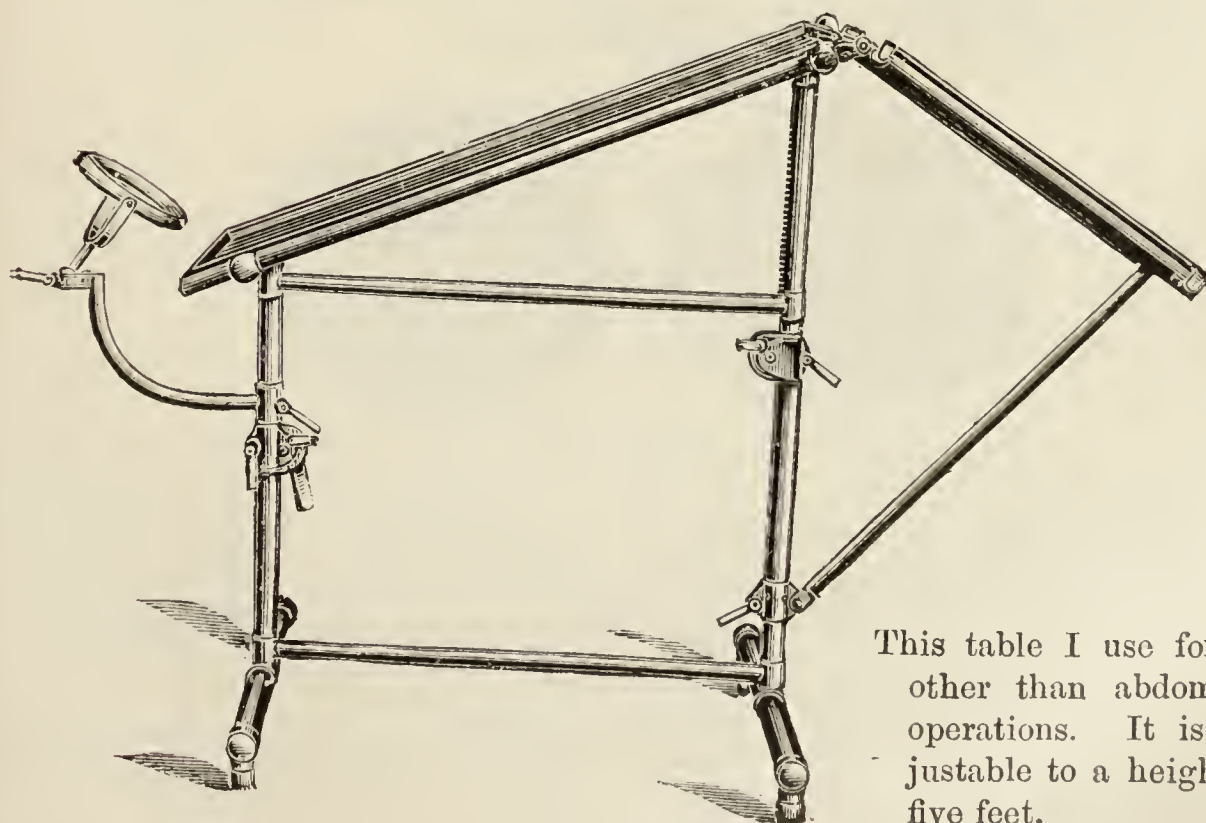


FIG. 91.—ADJUSTABLE FRAME FOR TRENDELENBURG'S POSITION.



This table I use for all other than abdominal operations. It is adjustable to a height of five feet.

FIG. 92.—GREIG SMITH'S TABLE OF GLASS AND NICKEL.

this risk in the private house than elsewhere. It is always better to make the most careful selection of the nurse or nurses who directly assist, and never to permit any nurse who prepares the patient, or places her on the table, to assist in operation unless there has been the most rigorous subsequent disinfection secured before any instruments or appliances are handled.

In any private house, the operating-room should be as far as possible removed from a lavatory or housemaid's closet, and the most careful disinfection of these should be secured if they are near the room in which the patient sleeps after operation.

Everything needful for an operation should be ready before it commences, and there should be no necessity for any one to leave the apartment while it is proceeding. In any private house there ought to be in readiness for the surgeon—

A few small buckets or pails.
Sufficient basins.
Disinfectant solutions.
Some perchloride of mercury
and absolute alcohol.
A supply of boiled and hot water.
Towels.
Small blankets.
A hypodermic needle with tablets
of strychnine.
Some flannel bandages.
Irrigation-douche with tube and
nozzle.

Two rubber sheets.
A suitable table which has been
well scrubbed with disinfectant.
Small table for anæsthetist's
instruments.
Small tables for separate basins
for the rinsing of the operator's
and assistants' hands.
Restoratives, kept together, and
apart, for use in emergency.

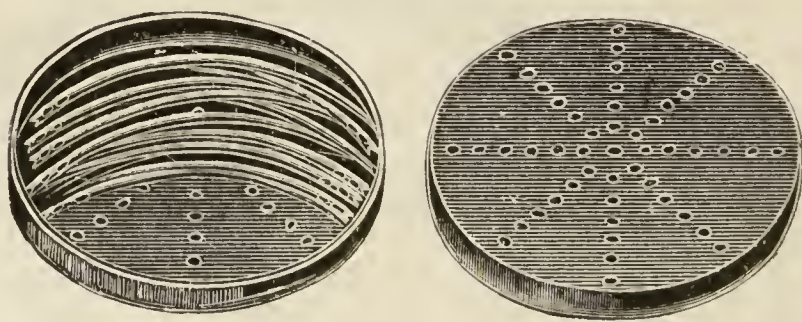


FIG. 93.—NICKEL BOX FOR STERILIZING NEEDLES.

Sterilization of Appliances and Dressings.—In any aseptic operation the following articles should be ready sterilized: instruments, compresses, dabs, protectors for the bowel, gauze, ligatures, sutures, and drainage-tubes, with sterilized iodoform gauze.*

* All these can be taken, in sterilized boxes (unopened) or wrapped in sterilized towels, to a patient's house.

There are a few simple facts with regard to sterilization which have to be remembered. Bacteria do not survive a temperature from 120° to 180° C., and the spores of bacteria are destroyed by lower temperatures than these when they are submitted to air which is saturated with the vapour of water, while at even lower temperatures still—say 100° C.—micro-organisms succumb if the temperature be maintained for a sufficient time, and repeated by successive sterilizations.

The dry stove I employ for sterilizing instruments is that of Poupinel;* it is a small model of that used by Doyen. It contains

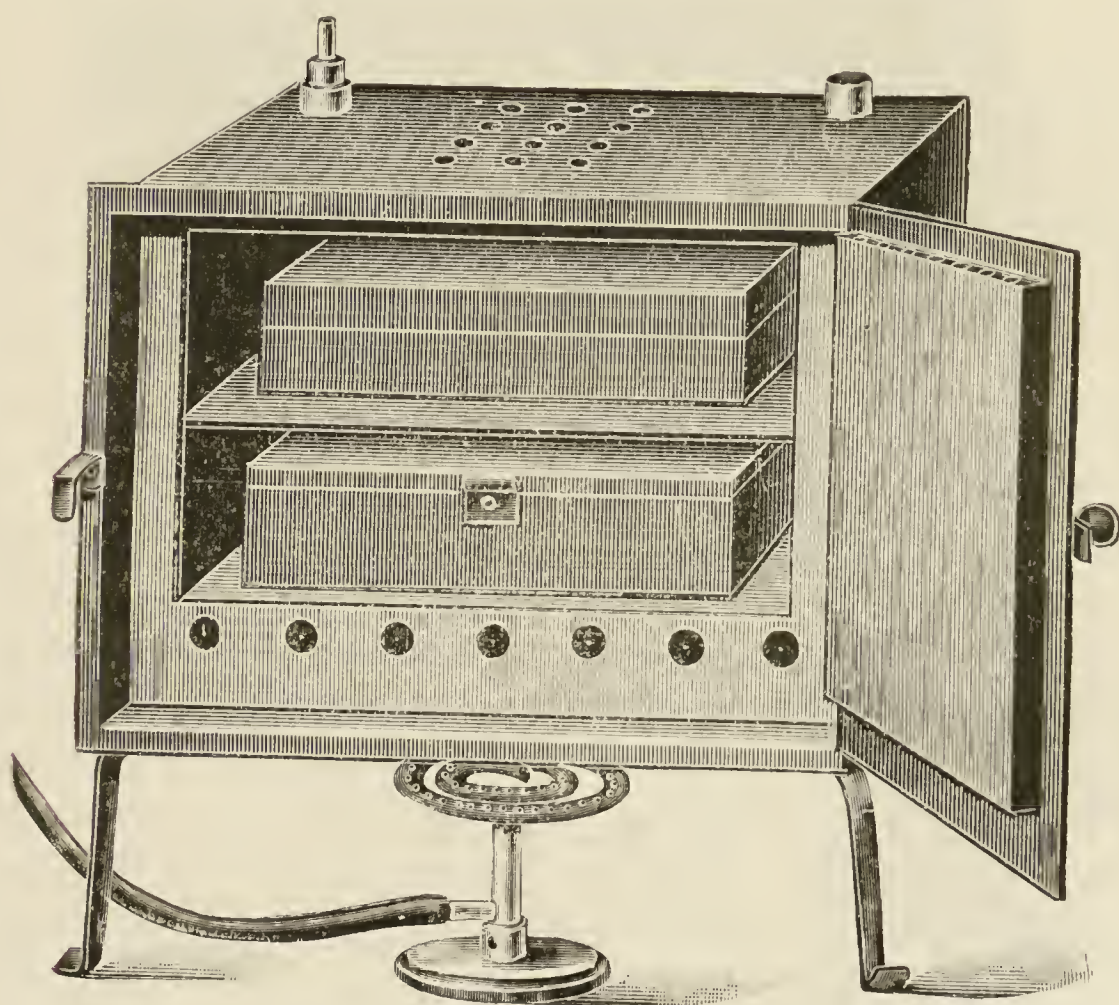


FIG. 94.—DRY STOVE FOR INSTRUMENTS.

air-tight copper or nickel boxes for the instruments. The temperature in this stove rises from 150° to 160° , and the sterilization lasts for one hour. I use Chamberland's *autoclave* (Fig. 96), or vapour-stove, for the sterilization of the dressings, compresses, mops, dabs, etc.† In this stove can be placed two air-tight nickel bottles or boxes containing the various articles to be sterilized. Such are portable, and can be carried by the surgeon in going any distance to an operation. The dressings, previously moistened with water,

* Made by Lequeux (Maison Wiesnegg, 64 Rue Gay-lussac, Paris).

† The pads used instead of sponges are made of absorbent wool enclosed in gauze. Dabs are cut in squares from butter muslin; thicker squares of the same or of fine *toile* are used for protecting the skin, the edges of the wound, and the intestines.

not too tightly pressed in the nickel box, are subjected to a temperature of 140° . After sterilization they are moist, to which there is no objection. One hundred and twenty degrees of heat is sufficient for the sterilization of the silk ligatures, as a greater degree of heat is apt to injure them. The silk may be rolled on glass or nickel reels, wrapped in gauze, and placed, moistened with water, in a nickel bottle. *Such silk serves only for one operation.*

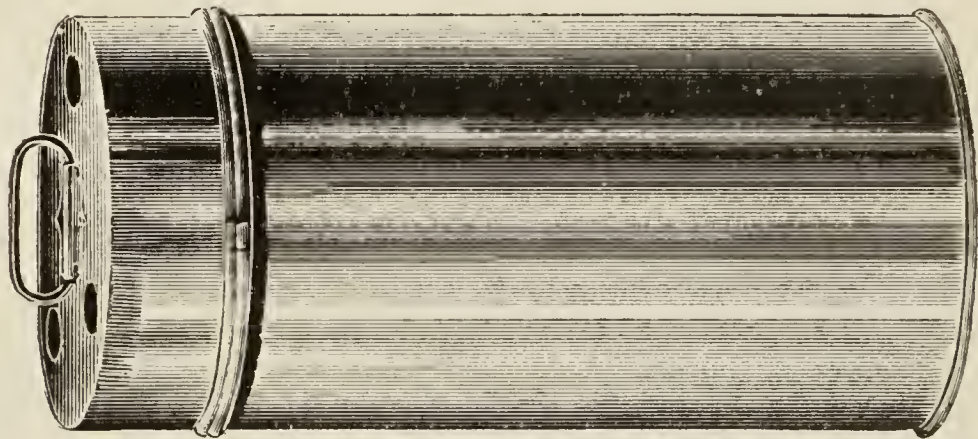


FIG. 95.—NICKEL BOX FOR PLACING IN THE VAPOUR STERILIZER.

Sterilization of Gut.—For the sterilization of catgut* the method I have adopted is that employed by A. Martin's *klinik*. The catgut is laid on flat glass plates and placed for six hours in a $\frac{1}{1000}$ solution of corrosive sublimate (without alcohol), so that the catgut is well covered by the solution. It is then taken out and placed for twelve hours in a solution composed of two parts of the best alcohol and one part of oil of juniper. It is then transferred to some of the same solution, but *newly prepared*, and kept in this till required; but it must so remain at least fourteen days before it can be used. Should any fatty matter appear on the top, it must be carefully removed with a spoon. I transfer the gut to absolute alcohol, and allow it to remain for three months in this before using it, changing the alcohol occasionally.

Krönig cumol gut I have now used in a very large number of abdominal operations. It has answered admirably. The process by which it is prepared is that of Professor Krönig, and this is carried out exactly in Dronke's Fabrik in Cologne. It is sterilized and sent out in hermetically sealed boxes ready for use.† Save in

* Thoroughly reliable gut of every size may be had (with full instructions for its sterilization) of M. Boehme, 54, Orienburger Str., Berlin. Glass reels, and all the necessary appliances for silk and gut sterilization, can be had of these makers. This gut, which is that used by A. Martin, can be had of different thicknesses. It is very strong and bears any needed strain.

† Dronke's Catgut Handlung Höltn a Rh. This is described fully in the *Münchener medicinischen Wochenschrift*, No. 44, 1901.

the instance of the very large thicknesses of gut, which may, in order to soften them, be first dipped in sterilized water or perchloride solution, this gut is used direct from the boxes. It can be had in eight sizes. At the same time, save for the convenience of obtaining it ready to hand, and without the necessity of preparation, I do not think that it possesses any great advantage over the gut, prepared by Martin's process, that I have been using. If the directions be carefully followed, and the gut itself be good, I can guarantee it to give complete satisfaction.

Chromicized cumol gut is prepared by Krönig and Zweifel as follows: It is first wound on a glass plate with ground edges, so as not to cut it. It is next placed in chromic solution for fifteen minutes (1 in 1000), and then washed in water. It is a second time placed for fifteen minutes in the chromic solution, and dried at a temperature of 80° C. It is then made into rolls and subjected to 100° C. This drying must be complete. It is then placed in cumol for an hour and a half, at a temperature of 160° C. It is now put into benzine of petroleum with a sterilized forceps, and the benzine is changed after half an hour. It is finally placed in sterilized glasses, and is ready for use.

Silk.* — The following is the method of sterilizing silk employed in Johns Hopkins Hospital, and it is that pursued by me. The skeins of silk are opened and cut in lengths of 40 centimetres (16 inches) for carriers, and 24 to 30 centimetres (9 to 12 inches) for ligatures and sutures. Some of these are wound on a glass reel; and a few such, of assorted sizes, are dropped into a stout glass ignition-tube devised for this purpose. Several of these tubes, plugged loosely with cotton, are put into a steam sterilizer for an hour the first day, and on the two following days for half an hour each time. The steam passes through the cotton without restraint, and acts upon the silk as easily as if it lay loose in the sterilizer. On removing the tubes the cotton in the mouth is pushed tightly in, and they are stored away in glass jars until wanted. Silk which remains over after an operation may be resterilized in the same way, but it is apt to be weakened after the

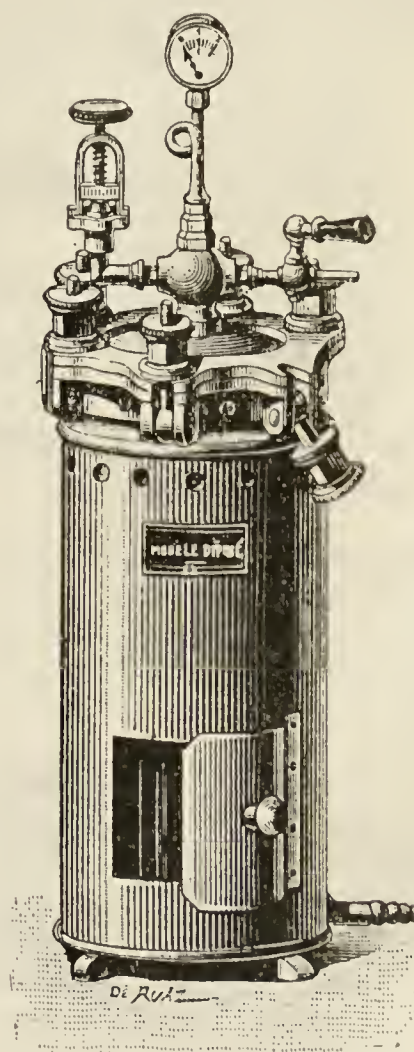


FIG. 96. — SMALL VAPOUR STERILIZER FOR PRIVATE INSTALLATION.

* The author has almost entirely abandoned the use of silk in his technique in pelvic operations.

second sterilization. I find the hermetically closed glass jars of Leiter admirable for preserving the silk.

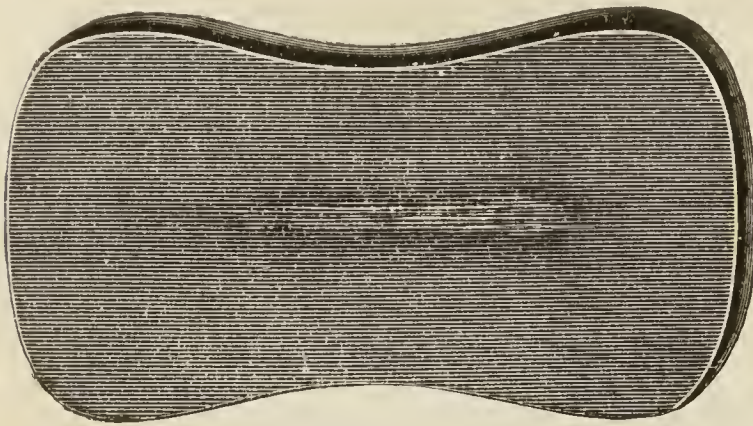
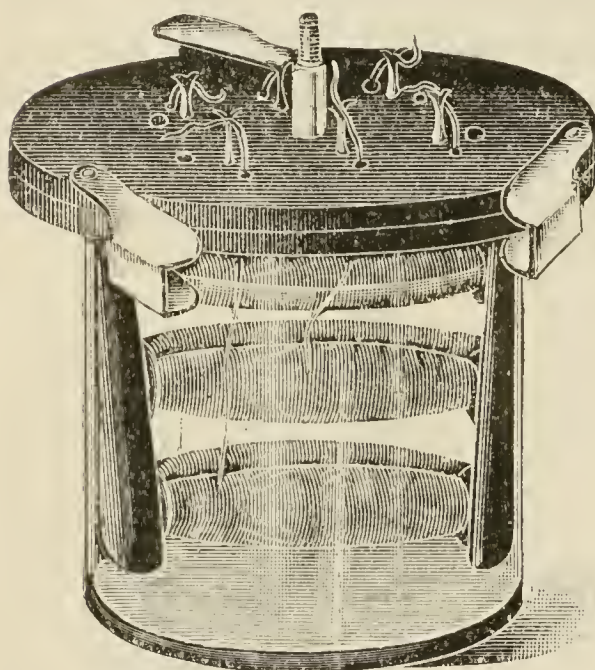


FIG. 97.—GLASS REEL TO KEEP GUT IN SOLUTION.



Open for use.

FIG. 98. — LEITER'S HERMETICALLY CLOSED VULCANITE AND GLASS JAR FOR SIX SILK REELS, CONTAINING SIX DIFFERENT SIZES OF SILK.

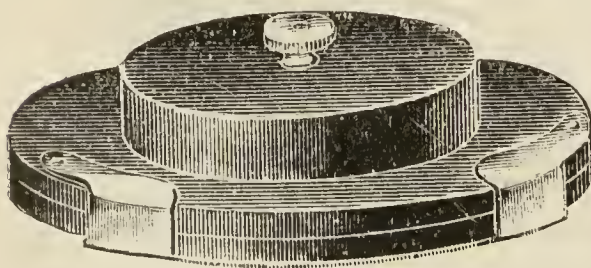


FIG. 99.—A VULCANITE CAP, WHICH FITS AIR-TIGHT, IS SECURED BY THE CENTRAL SCREW, AND COVERS THE SILK.

Bergmann, of Berlin, places the catgut in 1 per cent. sublimate solution and 80 per cent. of alcohol. It is left for at least 48 hours. This immersion is renewed in fresh solution every few days until the fluid is quite clear; then the gut is kept in ordinary alcohol.

Hofmeister, of Tübingen, proceeds as follows: The raw catgut is wound without any preparation on strong glass plates or reels, so that each thread lies next to the other. The thread must be carefully and tightly wound, and the ends are best knotted. The rolled-up catgut is then placed—

1. For 12 to 48 hours in a 2 to 4 per cent. formalin solution.
2. In running water for 12 hours, to get rid of the superfluous formalin.
3. It is boiled in water for 10 to 20 minutes.
4. It is hardened and kept in a mixture of absolute alcohol, with 5 per cent. of glycerine, and either 4 per cent. carbolic acid or 1 per cent. corrosive sublimate.

Silkworm Gut.—To sterilize silkworm gut, a dozen pieces or more are loosely twisted together, doubled, and put into an ignition-tube or a piece of ignition glass tubing plugged at both ends, and sterilized in the same way as the silk.

Celloidinzwirn. — Celloidinzwirn is a very strong white thread of cotton impregnated with celloidin. It has the advantage over silk of cheapness and power of resistance to heat sterilization. The celloidin increases greatly the strength of the thread. It was first recommended by T. Braun,

and is prepared in exact accordance with his instructions by Schaedel of Leipzig.* It must be boiled or sterilized by steam before use, and then kept in perchloride solution. It can be used both for superficial and deep sutures and ligatures. Not having the elasticity of silk, too great a strain must not be put on it in tying.†

Bronze-Aluminium Wire.—This wire I first saw used by Professor Bumm in Halle. I have employed it in several cases. It makes an admirable suture for the skin. It can be sterilized with the other



FIG. 100.—GLASS NEEDLE-CASE FOR KEEPING STERILIZED NEEDLES.

instruments. It causes no irritation, and can be allowed to remain for a fortnight if necessary. It may be used as a continuous suture.

Sponges.—The difficulty in thoroughly sterilizing sponges has, I think rightly, led to the rejection of them by most surgeons. At the same time, if we can secure such sterilization, a sponge is for some purposes the most absorptive material we can use. No matter how guaranteed by a chemist or instrument-maker, the surgeon should himself secure the purity of the sponge before he uses it. The prepared and compressed sponges sold by most instrument-makers, when soaked in boiling water and placed for some hours in a five per cent. solution of carbolic acid, are among the best. The precautions of soaking every newly purchased sponge in boiling water, and, after it has lain in it for some time, allowing it to lie for a few hours in a strong carbolic or perchloride solution, should at least be observed. A perfect sponge is of that size to be grasped conveniently in the fingers, and to absorb a sufficient quantity of fluid. Those sold are often too small. They should not be too porous nor readily tearable, neither should they feel hard, coarse, or rough. The sponge should be complete in itself.

* Alexander Schaedel, Reichstrasse 14, Leipzig. This material I now use almost altogether in suturing the skin; only very rarely do I employ the bronze-aluminium.

† *München. med. Wochenschrift*, Nos. 14 and 15.

In Johns Hopkins Hospital the process followed for preparing sponges is as follows:—

- ‘1. Lay them in a stout cloth and pound sufficiently to break up grit and lime.
- ‘2. Rinse with warm water ten or more times until it remains clear.
- ‘3. Immerse in a muriatic acid solution, 15 cubic centimetres to 1 litre (3 ij to 0 j.), for twenty-four hours.
- ‘4. Immerse in saturated warm permanganate of potash solution.
- ‘5. Decolourize in a hot saturated oxalic acid solution.
- ‘6. Pass through lime-water to take out all the oxalic acid.
- ‘7. Rinse thoroughly in plain sterilized water.
- ‘8. Immerse in a 1 in 1000 solution of bichloride of mercury for twenty-four hours.

‘9. Preserve, until used, in a 3 per cent. carbolic acid solution.’

‘The hands manipulating the sponges during these preparations, from step 4 on, must be sterile, and much of the manipulation may be done with instruments.

‘When wanted for use the sponges are lifted out with a long pair of sterilized forceps and rinsed in sterilized water. I never use the same sponge twice, although this may be safely done after aseptic operations.’

‘**Iodoform Gauze** is prepared (with aseptic hands) by rolling plain sterilized gauze in 3-metre (about 3-yard) lengths, and then cutting up the roll into different lengths and breadths to meet the various requirements.

‘Before dividing the large roll into these smaller pieces, it is saturated with the following iodoform mixture: To 180 cubic centimetres (6 ounces) of warm water, made into a good suds with Castile soap, add 45 cubic centimetres (an ounce and a half) of powdered iodoform, and mix it well in a clean basin with a glass rod. Then immerse the roll of gauze in the liquid, and work it with the hands until the iodoform has been completely taken up into the meshes of the roll. This is now sterilized three times in the steam sterilizer.’

Drainage-tubes are best treated by placing them in the sterilizer used for the dressings. When taken out they can be kept in carbolic acid solution 5 per cent. Just before use they should be washed in sterilized water and transferred to a 2 per cent. formalin solution. Glass drainage-tubes are placed with the instruments in the dry sterilizer.

Sterilization of Large Compresses.—Additional security for the preparation of the larger compresses when the muslin is new, can be had by boiling them in a solution of permanganate of potash for about half an hour, after which they are treated with bisulphite of sodium in order to decolorize them. Two litres of 1 in 1000 permanganate solution are calculated for about 2 ozs. in weight of sponges. The latter are washed with sterilized water, after some hours’ resting in the permanganate liquid, so as to free them from the precipitate of oxide of manganese. About 9 ozs. of a 10 per cent. solution of bisulphite of sodium in the 2 litres of water will be required to thoroughly decolorize the sponges, and 1 dram of pure hydrochloric acid is added to the solution. They are then washed in boiling water, so as to remove every

trace of sulphurous acid, when they are dried and sterilized in the Poupinel stove. They can then be kept either in a solution of carbolic acid or sublimate. If ordinary sponges be used, they should be prepared by the permanganate of potash method, followed by decolorization with either oxalic acid or bisulphite of sodium, thorough washing with sterilized water, and retention until required for use in a 5 per cent. carbolic solution. It may be well always to have some such sponges at hand, more particularly the larger and flatter ones.

Air-tight aseptic containers for medicated bandages, dressings, and gauzes, as well as aseptic ligatures of various lengths prepared in sterilized capsules and heated in cumol at a temperature of 330° Fahrenheit, can be had. They have the advantage of portability, and are guaranteed to resist any bacteriological test.*

Preparation of the Surgeon and his Assistants.

The requirements of ordinary cleanliness, such as frequent bathing, changes of underlinen, etc., are naturally stringently binding on the surgeon, but they are not all he has to consider. For operating he should be dressed in a clean, preferably sterilized, suit, or jacket and apron, and the arms should be bare from well above the elbows downwards. The same remark applies to his assistants. Nurses should wear clean linen over-all aprons, and have their arms bare. For the proper disinfection of the hands of operator, assistants, and nurses, minute precautions are necessary.

As to the surgeon's, assistants', and nurses' arms and hands, it may be safely said that it takes at the very least ten minutes' time to prepare these. Preferably, they should be washed (from above the elbows down) under a tap of running



FIG. 101.—ASSISTANT READY FOR OPERATION.

Underneath the overall is a "combination" suit of linen.

* The containers and dressings are made by Messrs. Seabury and Johnson.

lysoform, and with Izal soap. The nail-brushes should be kept always in antiseptic fluid in air-tight glass boxes (which are now easily obtainable), to the covers of which they are screwed, being thus constantly soaked in the antiseptic. The glass cover thus forms the back of the brush. The arms should be several times well soaped as well as the hands, with nails closely pared, and sub-



FIG. 102.—SURGEON WITH OVERALLS AND WATERPROOF APRON PREPARED FOR VAGINAL OPERATION.

jected to repeated cleansings, and the arms and hands both finally scrubbed over with 1 in 1000 sublimate solution. *Then the hands, wrists, and arms are pressed down and kept for a few minutes in a basin of equal parts of sublimate solution (1 in 1000) and absolute alcohol, which solution is also carried over the arms.* The hands of the operator, his immediate assistant, the overseer of the instruments and ligatures, or those of any nurse who may have to handle instruments, sponges, or dressings, should be prepared with equal care. There should also be, at the side of the operator, a small washstand, or preferably a movable *lavabo* on castors, which has two jars provided with taps over basins containing sterilized water and *lysoform*, in which his

hands can be rinsed from time to time during the operation.

Some surgeons prefer the permanganate of potash and oxalic-acid method of disinfecting the hands. The efficacy of the method was tested by Ghiskey and Robb at the Johns Hopkins Hospital, and it was proved that by far the more powerful of the two germicides is oxalic acid.

Absolute Alcohol.—The experiments of Ahlfeld, Reineicke, and Poten, confirmed by Fuerbringer and Freyhau, showed that the bactericidal properties of alcohol, in combination with corrosive sublimate, are to be ascribed to the removal of the fat of the skin of the hand, while its power of uniting with water renders disinfection

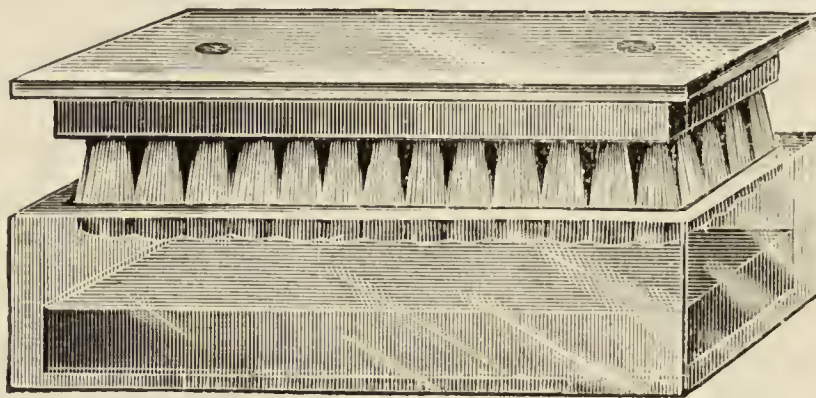


FIG. 103.—ASEPTIC NAIL-BRUSH WITH BOX.

These brushes should always be kept in the theatre under lock and key; the box filled with 1 in 1000 of formalin.

of the tissues easy by the associated sublimate or its subsequent solution, at the same time that the squamous epithelium and the superficial impurities as well as the bacilli are removed. The arms should be washed with the mercuric and alcohol solution, and the hands *immersed in it* for some two minutes before their sterilization is complete.

Antiseptics.

The best antiseptics are lysoform, carbolic acid, corrosive sublimate, ethylene-diamine mercuric-citrate, formalin, iodoform, lysol, naphthol B, dermatol. Ethylene-diamine mercuric-citrate has a greater power of penetration and less injurious action on the skin of the hands than the perchloride. It is weaker than perchloride, 3 in 1000 being equal to 1 in 1000 of the perchloride.*

It is asserted for *traumatol* that its antiseptic power is as strong as corrosive sublimate, and from experiments made comparatively with iodoform upon cultivations of the *Staphylococcus aureus* by dusting these with the powder, the traumatol-treated cultures were not liquified before the eleventh day, whereas the iodoform ones were completely liquified in forty-eight hours. The injection of guinea-pigs with traumatol has proved how innocuous it is as compared with iodoform, and similarly in the case of its internal administration. It is an iodocresylic acid, and contains 54·4 per cent. of iodine, in combination with cresylic acid. Its bactericidal action would

* 'Chemisch Fabrik auf Actien,' E. Schering, Berlin.

appear to depend more upon the cresylic acid than on the iodine, as it contains much less iodine than the iodoform. It has not the disagreeable odour of iodoform, but rather an aromatic smell. I frequently use dermatol.

Corrosive Sublimate I only use for sterilization of the hands and the skin of the abdomen, or in sterilization of the vagina. *Lysoform* I now use largely in the preparation of the hands, for douching, and for washing the abdomen. *Formalin* I employ largely in the strength of 1 in 1000 for cleansing of the hands in post-operative dressings of wounds for the first few times, for vaginal douchings, in the separation of sutures, and, when there are septic discharges, for the cleansing of sinuses (when I employ a strength of 1 per cent.). Weak solutions 1 in 5000 to 1 in 10,000 I have frequently used in abdominal irrigations. I also generally make it my first dressing after laparotomy, moistening the sterilized iodoform gauze in it. Formalin in vapour I avail of in the larger "Alformant" lamps for my operation-room and clothes cupboard. Drainage-tubes are immersed in a solution of 1 per cent. before they are inserted. Glass catheters are always kept in formalin solution, two being used with every case in which catheterization is necessary, one being taken fresh each time from the formalin solution. *Lysoform*: For ordinary douchings of the vagina I use lysoform, and employ entirely lysoform or izal soap for washing purposes. *Carbolic acid*, save for keeping silk, drainage-tubes, taps, douche-pipes, and other appliances in, I never employ.

Asepsis: General Observations on.—*During an operation*, asepsis means scrupulous care in the placing and replacing of instruments, the occasional dipping or boiling of these if necessary, periodical cleansing of the hands of the surgeons and assistants (each of the latter being confined to his own special duties), the rejection of instruments not re-sterilized, needles or others that may possibly have been infected in any step of the operation, the flushing and cleansing as far as possible of infected areas and cavities with weak formalin fluid, rapid and effective hæmostasis, with final cleansing from all remains of blood or coagula, and then proceeding to the abdominal toilet with freshly cleansed hands and thoroughly cleansed tissues and skin. Lastly, in the abdominal toilet itself, careful adjustment of the layers, and the use for the cutaneous wound of sterilized non-absorbable material.

What, then, are the most important essentials in obtaining an ideal gynæcological asepsis? And first we have to answer the question, Is such an ideal perfection possible? I fear it is not, or at least

that it can seldom be reached. This arises from a threefold cause. There is the impossibility, even by the most carefully carried out antiseptis, of entirely excluding germs from the skin wound and from the vagina, more particularly if in the latter there be any abraded surfaces, and that pathogenic organisms be present from uterine erosions and discharges, as well as in those septic states met with in many abdominal and pelvic operations from which infection may spread. Secondly, there are predisposing influences which may be entirely outside the power of any anticipatory or preventive measures to control. We have examples of this in the proneness to suppuration in certain individuals, due either to some condition of the tissues favourable to microbial growth, or to some special virulence and toxic properties in the pyogenic organisms present, or in the toxic matters to which they give rise. Here we have to take into account lowered vitality and defective powers of resistance on the part of the individual and the tissues, lessening any ordinary protective influence against septic invasion. Lastly, there are the many avenues through which infection may be admitted by even the most careful of nurses, assistants, and surgeons,—through some defect in the preliminary precautions, the surrounding atmosphere, the appliances in the operating-room ; the instruments, some oversight or carelessness on the part of the nurse, surgeon, or assistants during the operation ; defective sterilization of water, or through any source of infection that may be overlooked in the final toilet and dressing of the wound.

In view of so many means of admission of infection, it is obvious how difficult is the attempt to obtain such an ideal asepsis as will secure for us the absence of septic germs from a wound. The recognition of this difficulty is the first step in the education of both surgeon and nurse, and if this be true under ordinary circumstances, how much greater must be the care taken and the precautions adopted, when either nurse or surgeon is brought in contact with any septic case within a given time before the operation. This involves on the part of both not merely preparation immediately before the operation takes place, whether in an ordinary room or operating theatre, but exceptional precautions in private in regard to the cleansing of the arms and hands, as well as the use of fresh underclothing and linen on the day of an operation.

Ideal asepsis, therefore, presupposes a perfectly constructed theatre with every aseptic appliance, and the most scrupulous attention to details in the persons and surroundings of the operator, assistants,

and nurses. Summarising these, they include a theatre capable of being well ventilated, at a temperature of 100°, with a supply of filtered air, well lighted, with tiled walls, and a concreted and drained floor, perfectly trapped, thus enabling all fluid to run from it without any possibility of infective reflux of gases; all washing sinks and baskets for dressings worked by foot-pedal, and all the appliances capable of disinfection or sterilization. It also involves the complete sterilization of every material, whether in clothing worn by the patient or nurses, towels, bandages, compresses, dabs, sponges, and dressings. With regard to the preparation of the hands of the surgeon, assistants, and nurses, it takes for granted perfect sterilization of the arms, hands, and nails, not only before, but all through an operation, and the same may be said of the appliances and instruments used in conducting it. In such a theatre, and under these conditions, if the patient be properly prepared, an asepsis that may be called ideal can be secured.

Preparation of the Patient.

Sterilization of the Abdomen.—All preparations should be concealed from the patient, and if possible the anæsthetic should be administered in an adjoining room. When the patient is placed on the operating-table, all dressings and appliances should be in their right places. The needles and ligatures are assorted, the accessory requisites are all placed, the small forcipressure forceps are counted. Each assistant and nurse is in his or her proper position. From this moment to the conclusion of the operation there should be no speaking, and only the operator's voice, in addressing his immediate assistant, should be heard.

What is involved in the preparation of a patient? We may include previous thorough ablution of the body, with careful shaving of the part, proper emptying and disinfection of the bowel, softening and disinfection of the skin of the abdomen, with thorough cleansing and disinfection of the vagina, and curettage of the uterine canal when necessary.

Coming to the *immediate preparations*, if these be done in the theatre or an apartment adjoining, under the conditions mentioned, the body of the patient (nude, save for the aseptically covered upper and lower extremities) can be thoroughly disinfected by lavements with wood fibre sponge and izal or lysoform soap, from the thorax to the thighs, first with sterilized water, next with

PLATE IX.



PATIENT PREPARED FOR OPERATION—WOOLLEN JACKET, MUSLIN SLIPS HELD BY LIGHT CLAMP OR SPONGE HOLDERS; SACK DRAWERS ARE DRAWN OVER WOOLLEN STOCKINGS (ALL STERILIZED). (See p. 129.)



SAME IN PARTIAL TRENDLENBURG POSITION.

[To face p. 128.]



sublimate solution, followed by sublimate and absolute alcohol, and finally ether. This should be done by an assistant, and with rubber gloves. *Sterilized sack drawers are then drawn over the flannel bandages which have been previously applied, the drawers reaching to the groin, and there loosely tied. A sterilized flannel jacket opening behind is then slipped over the trunk. Three pieces of soft muslin material, about two yards long by half a yard wide, are next taken, one having an oval aperture cut in the centre for the abdomen. The first is laid across the lower part of the abdomen, and covers the drawers; the second is placed with the aperture over the operative area; the third meets the jacket, covering the chest above. All three are clamped together at the sides by sterilized sponge-holders or clamp forceps. These keep the coverings immovable during the operation. If soiled during the operation they are readily replaced.*

As little of the surface of the part to be operated upon as is possible is exposed before the first incision is made. For example, in oöphorectomy or removal of the appendix it is not necessary to bare more than a few inches, the needful space being left uncovered by placing the small aseptic cloths, taken straight from the sterilizer, around the area of the wound. All the compresses and gauze dressings, as well as the sponges, are in like manner taken straight from the pedal-boxes, out of the sterilizer, and these compresses and dressings are alone used (without any disinfectant) for hæmostasis, for tampons, the exclusion of the intestines, and the protection of organs and vessels. The compresses are easily caught with a catch forceps, which is thrown over the edge of the wound so as to facilitate removal.

Sterilization of the Vagina and Cervical Canal.—With regard to the vagina, after careful washing of the external genitals with *Holz-wolle* sponge (Waschel) and antiseptic soap, which is continued with

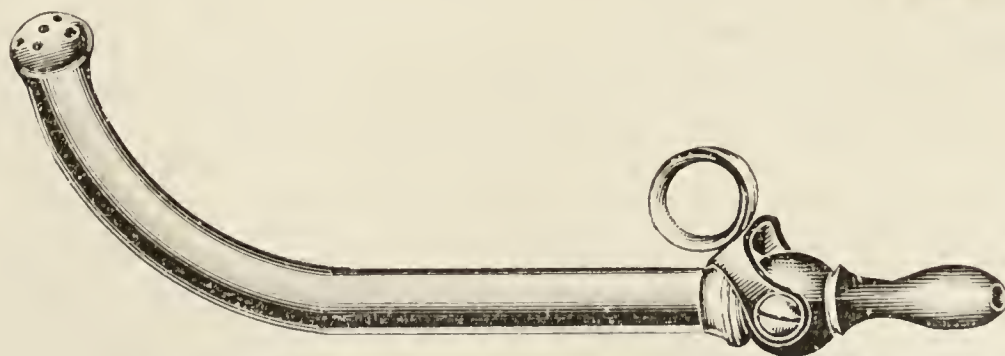


FIG. 104.—NICKEL-PLATED VAGINA DOUCHE PIPE.

alternate douching for a few minutes, the vaginal walls internally are well lathered with the same and washed with repeated douchings. This is done with the sterilized hand of the nurse. The whole canal is

then repeatedly mopped out with gauze mercurialized dabs on sponge-holders. If the cervical canal has to be sterilized the uterine neck is seized with tenacula, and drawn well down. Martin's curette is next used to the uterine canal, which is then douched out with the antiseptic solution, iodine, lysol, or other, as may be selected, or it is mopped out with a 20-gr. to the ounce solution of chromic acid. The vagina and cervix are thus sterilized. After sterilization of the cervical canal, it is the practice of some gynæcologists to amputate the lower portion of the cervix, and then suture the divided lips together. Others prefer the use of Paquelin's or the porcelain galvano-cautery.



FIG. 105.—FLUSHING VAGINAL RETRACTOR.

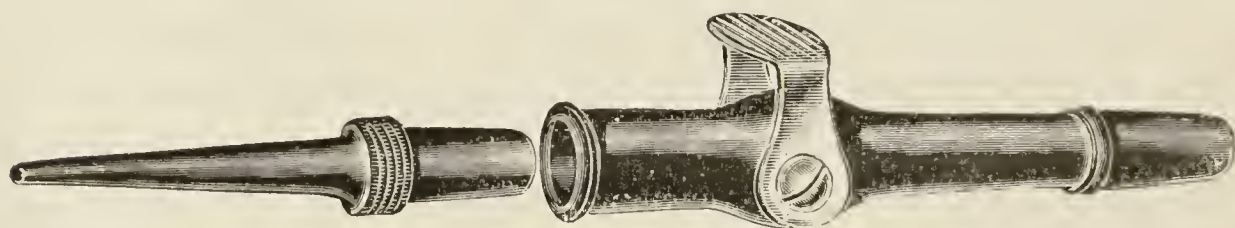


FIG. 105A.—TAP WITH ADJUSTABLE NOZZLE.

A most valuable instrument for all vaginal operations is the flushing vaginal retractor. It is an admirable instrument, and is always under the control of one of the assistants. A tube connects it with the douche reservoir, and the strength of the stream is regulated by a stop-cock.

Precautions regarding Nurses.—Two nurses are placed a little behind and to the operator's right, one for the immediate passing of sponges, dabs, tampons, etc. The second nurse passes to her all such fresh gauze or other dressings, and, if ordinary sponges are used, she sees to the rinsing and return of these. *Neither of these nurses should, before final sterilization of the hands and arms, touch anything in the shape of an instrument, appliance, sponge, cloth, or dressing used in the operation.* Should only two nurses be available, the one who places the patient on the table, and sees to the arrangement of the clothes and coverings, should sterilize both hands and arms before taking her place at the operation.

The rules I insist on for nurses are as follows :—

One nurse prepares the patient, as instructed, on the morning of the operation. She sees to the shaving, washing, and disinfection of the case, and the bringing of the patient into the operating-room. She sees to the arrangement of her clothes when on the table. She does not touch, from first to last, anything, whether instrument, sponge, compress, or dressing, which is used in the operation.

She sees to the different aprons and overalls for the doctors, she stands by during the operation, but does not take part in any manipulation concerned with the operation itself, or the appliances. This rule is never infringed.*

Aseptic Nurses.—*Nurse No. 1 is responsible for the previous sterilization of everything which is used, or that may be required to be used, during an operation. She is careful that nothing which has not been sterilized can possibly come within reach of the operator or assistants. She takes charge of all sponges or compresses, and hands them directly to the operator or assistant, standing immediately behind him. If ordinary sponges are at any time used, she passes these to the second nurse for rinsing and returning. She is responsible for the counting of sponges (should such be used) and torsion forceps.*

Nurse No. 2 stands near No. 1, and is ready to assist with dabs and irrigator, or anything that may be directly required in the operation itself. No nurse taking a direct part in the operation is, during its progress, to pick up anything dropped on the floor. No nurse is to assist who has any infectious wound or sore on the hand, or who suffers from cold in the head.

After the hands and nails of the two nurses assisting have been rendered thoroughly aseptic, they must not touch anything which has not been sterilized.

Another nurse assists immediately after the operation in the thorough cleansing and drying of the instruments.

Causes of Failure.—It is well to enumerate and emphasize what are the principal causes of failure in securing thorough asepsis. (1) *Defective sterilization of the rectum and vagina for at least forty-eight hours prior to operating.*

In the instance of the rectum this is avoided by the use of saline aperients, a dose of calomel, and lavage of the rectum with 1 in 1000 of permanganate of potash in sterilized water, or a sterilized solution of boric acid, and of the vagina by thorough washing out with 1 in 1000 of formalin solution, lysol, formalin or perchloride of mercury,

* All necessary overalls and aprons can be had ready made of Messrs. Bohme, 54, Orienberger Strasse, Berlin, and M. Turinsky, Garrison Strasse, Vienna.

followed by the insertion of a tampon or sterilized iodoform chinosol gauze.

(2) *The want of thorough cleansing of the entire body* of the patient by the use of a warm bath, in which the skin is well scrubbed with lysol soap. (3) *Defective shaving* of the entire hair of the external genitals after the final bath has been taken, this being followed by proper packing of the abdomen with an antiseptic pad, such as 1 in 1000 of formalin. (4) *Want of attention to the clothing of the patient when placed on the operating-table*, as to its warmth and cleanliness, and omitting to see that the feet and legs are well enveloped in sterilized flannel bandages. (5) *Inefficient sterilization of the abdomen* (especially of the umbilicus) or of the vagina—of the abdomen and umbilicus by a special washing when on the table with lysol soap and a brush, perchloride of mercury with alcohol, and finally ether the vagina I shall refer to again. (6) *Inefficient sterilization of the hands and arms* of the surgeon, assistants, or nurses, or, subsequent to their sterilization, the touching or handling of non-sterilized articles.

It is obviously ridiculous to see a surgeon who has prepared his hands making a resting-place for them on his hips, search in his waistcoat-pockets for a knife or pencil, place them on the sides of a chair or stool, twirl his moustache, or use a pocket-handkerchief; but even worse acts of forgetfulness than these have been noticed and commented upon by those who have visited some of our operative theatres.

As yet it is difficult to get the thoroughly trained aseptic nurse. It is pitiable that women are still turned out from their probationary course of training in such absolute ignorance of what should be the most essential part of their education. It is no uncommon thing to find gynæcological trained nurses preparing for an operation or dressings with long sleeves and cuffs, handling promiscuously the clothes or coverings of a patient and dressings or appliances, with the crudest ideas of sterilization, and a happy but reckless disregard in the handling of antiseptic dressings; the mixing of non-sterilized with sterilized water, in the using of cans and taps; *in washing with nail-brushes that have been employed previously and indiscriminately in private houses, homes, or in hospitals*; and with a startling indifference (in the post-operative dressing of cases) to the preparation of their hands and the possibility of conveying infection from septic cases that they may have at the time been attending to. (The best nail-brush is that which is screwed on to the glass lid of the glass box in which it is contained.) Worse still is their tendency to use the first towel or instrument that comes to hand, pleasantly oblivious as to its previous effective sterilization.

(7) Failure may be consequent upon *imperfectly sterilized sponges, gauze compresses, or dabs*; or, even if these have been made sterile, by their being brought in contact with any source of infection,

either through the hand of a nurse or assistant, or by careless re-use when they have been infected.

(8) Failure arising out of *infected instruments* is not likely to occur with any care, if they be sterilized by means of the dry stove, and are of such a kind that they can have their blades and handles easily detached, so that the joints may be thoroughly subjected to the necessary heat. Danger more frequently arises from *the use of instruments infected during the operation, and which are not re-sterilized at the time*. This is perhaps best obviated by having always at hand a nickel stove in which the water containing the sulphide of sodium is kept boiling, and into which the suspected instrument can be placed for some minutes before it is again used. This applies especially to needles which have been employed for suturing or ligaturing within the area of infected tissues. Hence the wisdom of having always prepared for any gynæcological operation a sufficient supply of all instruments that may possibly be called for, as, in emergency, imperfectly sterilized instruments may be used, or it may not be possible at the moment to re-sterilize an infected instrument. It is not necessary to comment on the re-use of any instrument or appliance which has once fallen from the hand of the operator.

(9) While *the position of Trendelenburg* is invaluable in the majority of pelvic operations, it has its dangers with regard to asepsis, from the tendency for infective fluids to gravitate from the pelvic cavity to the bowel, and thus infect the latter. Therefore, in such cases, the large flat natural sponges come in of use in protecting the bowel, and the extreme Trendelenburg position should be avoided. Judicious irrigation, with sterilized saline solution, followed by careful drying of any cavity, and of the irrigated parts, with gauze tampons or sponges, is the best means that we can adopt. If there be a fear of post-operative hæmorrhage, the iodoform gauze compress of Mikulicz, pressed down into the dried cavity, affords us the greatest security.

(10) When an operation is completed, and the hæmostasis is assured, and drainage if necessary provided, there are still remaining some most dangerous loopholes for sources of infection. These are to be found in the abdominal or vaginal toilet. The use of infected needles, imperfect sterilization of silk or catgut, as well as in the dressings of the wound, may furnish these, for instance, needles that have been used for suturing or ligaturing infected parts; or the handling of gut or silk, for neither should ever be

handled after sterilization, and should reach the wound only through sterilized forceps or scissors. In like manner the sterilized dressing for the wound, after the latter has been washed with 1 in 1000 of formalin, and dried, should be laid over it direct from the jar or bottle in which it has been sterilized or hermetically kept, and the same remark applies to the superficial sterilized wool covering. During any aseptic operation, there should be close at hand to the operator either a lavabo with tap or a basin with sterilized water and lysol or lysoform, renewed from time to time, in which the hands can be rinsed ; and after dealing with infected parts, or in any combined operation when passing from the vagina to the abdomen, re-sterilization of the hands should be practised before again proceeding with the operation. It is a good plan to dust the surface of the closed wound with dermatol, which is readily sterilizable, and is not irritating. I generally prefer, however, the washing of the surface of the skin with formalin, and then the application of the sterilized iodoform gauze.

Colætin.—The area of the wound may be hermetically covered with *colætin*. This is a fine adhesive material coated with zinc and lead. It is very adhesive. Under it a pad of iodoform gauze is placed.

Closure of the wound.—After careful readjustment of disturbed parts, such as the bowel and omentum, and having seen that the appendix is normal and in position, three deep sutures are carried through all the tissues with a Zweifel's needle from one side to the other, with the exception of the skin. These are long, and are allowed to drop at the sides, secured by forceps. *These deep through-and-through sutures are only used if the wound be large.* Next the peritoneum is closed by fine continuous sutures of cumol gut. Then the rectal fascia is freely separated with the handle of a scalpel, or the finger-nail, at either side from the muscle. The fascia is then made to overlap by continuous or interrupted suture of sterilized gut, cumol or

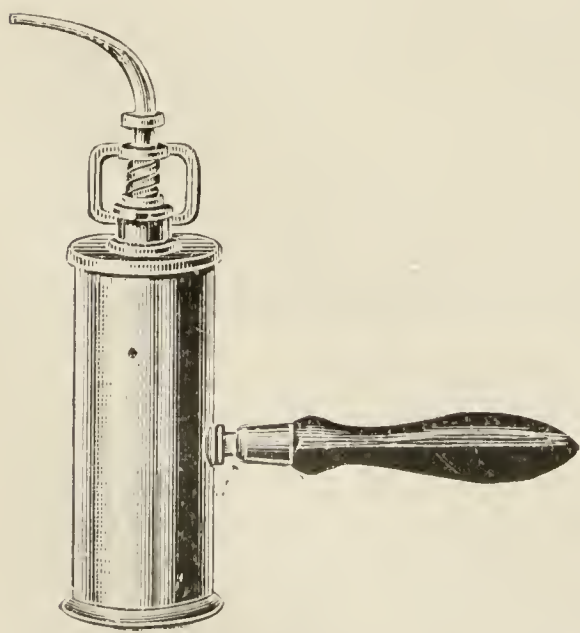


FIG. 106.—CATHETER STERILIZER.

other. In passing this suture a portion of the rectus muscle at either side is included. Lastly, the skin is closed by a continuous suture

of bronze aluminium wire, celloidinzwirn, or interrupted suture of silkworm gut. The closed wound is now sponged with formalin solution, and dried. It is next covered with a few layers of sterilized iodoform gauze, over which is placed a layer of colætin, which reaches from the umbilicus to the groin, and is about ten inches wide. This, properly trimmed at the groin, makes an impermeable covering. Over this is placed a light layer of sterilized wool, and over all is drawn a tailed domette binder.

Drainage.—Should septic complications be present, such as abscesses, ruptured pus sacs, pockets of septic pus, decomposing tissues, or bowel contamination, we have in irrigation with formalin solution and sterilized water, effective mopping out of any cavities in which septic material may have collected, and the iodoform drain, whether abdominal or vaginal, the best means of combating septic consequences.

With regard to the disputed question of drainage, it will be generally agreed that it is safer to drain in any of the following circumstances: (a) When pus has escaped into the peritoneal cavity. (b) When there has been considerable hæmorrhage difficult to arrest, and in which it has been necessary to use the aseptic tampon to restrain it, and when there is the consequent danger of the formation of clots. (c) In the presence of septic complications, where there has been

an escape of septic fluids, and, as is frequently the case in such instances, where extensive adhesions have necessitated prolonged stripping of tumours or sacs, with more tedious manipulation. (d) Drainage is indicated in certain cases of enucleation of myomata—in pan-hysterectomy for myoma, when there is the complication of pus tubes, or suppurating cysts of the ovary; when there has been hæmato-salpinx or a blood cyst of the ovary or meso-salpinx which may have been ruptured; in pan-hysterectomy for cancer; in some cases of supravaginal hysterectomy, with complications similar to those just mentioned, and where we are in doubt as to the infectivity of the cervical stump and canal. Here the plan may be



FIG. 107.—METAL BASKET WITH PEDAL - ACTING COVER.

There is an inside metal lining, which is taken straight from the sterilizer and placed in the basket. The latter is then locked until required for operation.

adopted of dividing the cervix, covering each separate pedicle with peritoneum, and passing the iodoform drain between the two; in sanguineous and suppurative ovarian cystomata; in colloid multilocular cystoma in which there is ascites present, and where there has been rupture of the cysts with escape of the contents into the peritoneal cavity.

(e) Drainage is necessary in colpotomy performed for pyo- or hydro-salpinx, hæmatocele, and other cases of ectopic gestation, and in suppurating cysts of the ovary, or meso-salpinx. (f) Drainage is indicated in vaginal operations and in cœliotomy, when there have been wounds of the bladder or bowel. Some may think that drainage is not necessary in a few of the conditions here mentioned, but I believe, with a view to asepsis, that temporary use of drainage under *all* these circumstances is better than the risk run by immediate closure of the wound. Sterilized iodoform gauze generally makes the best drain. If we drain by means of a tube, it should be taken straight from the carbolic immersion fluid, having been previously treated by boiling in a 5 per cent. solution of permanganate of potash, decolorized by bisulphide of sodium, and afterwards boiled in distilled water.

Catheters.—Two glass catheters should be in use in every case where the catheter is required. They should be sterilized after use, in a catheter sterilizer, and then placed in a 1 per cent. solution of formalin. If a sterilizer be not at hand, the catheter should



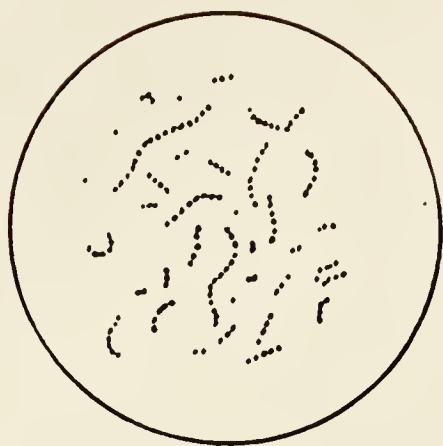
FIG. 108.—GLASS CATHETER.

be boiled and kept in a 5 per cent. carbolic or formalin solution until it is required. Thus a freshly sterilized instrument is used each time.

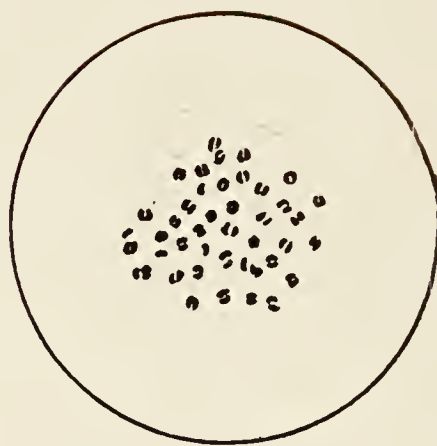
Subsequent Dressings.—In many cases, for some days it is unnecessary to change the dressing when all is progressing satisfactorily. When any dressing is about to be conducted, the hands, both of surgeon and nurse, should be rendered aseptic. All dressings should be in readiness and close by the patient, while the wound is exposed for as short a time as possible. The same remark applies to the removal of the skin sutures. I invariably use sterilized gauze, wet with a 1 per cent. formalin solution, to lay



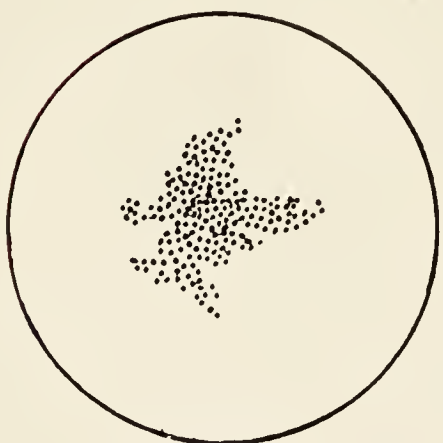
PLATE X.



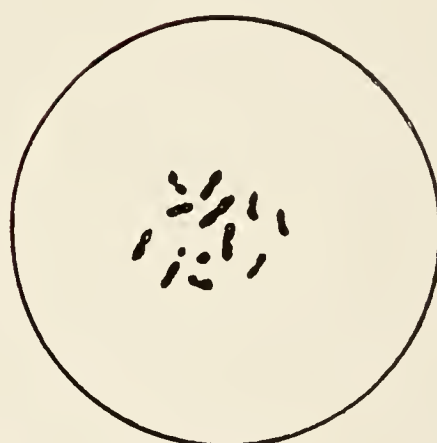
STREPTOCOCCUS PYOGENES
(1 × 1000).



GONOCOCCUS (NEISSER)
(1 × 1000).



STAPHYLOCOCCUS PYOGENES
(1 × 1000).



B. COLI COMMUNIS
(1 × 1000).



B. TUBERCULOSIS (1 × 1000).

[To face p. 137.]

over the wound immediately it is exposed, while the new dressings are being applied, the iodoform and gauze tampon or drain being removed after forty-eight hours.

Bacteriology.

More than a brief reference to the bacteriology of the female organs of generation is not possible, nor indeed would any lengthy description be desirable, as in the many admirable works on this subject, and in the bacteriological laboratory by practical investigation, the student or practitioner alone can hope to obtain a clear and comprehensive mastery of the subject. But as in dealing with various inflammatory processes it will be necessary to refer by name to certain micro-organisms which are associated with them, and more particularly with those of a septicæmic nature, it may be well here to particularize those organisms which have more special influence on gynæcological surgery and practice.

1. **Döderlein's Bacillus.**—It is now well known that Döderlein attributed a bactericidal influence to the vaginal secretion as long as it remained acid, which is its normal condition, and further, that this healthful influence was to be ascribed to an anaerobic bacillus which was easily cultivated on almost any media at 37° C. with 2 per cent. of glucose, or in hydrogen. Kroenig and Menge, however, described anaerobic non-pathogenic bacilli, which exist in the vagina and in its normal acid secretion, and are destructive of the pathogenic organisms. Their experiments would lead to the conclusion that in the vagina, with an unabraded mucus surface, we have, in its normal acid secretion, and in the naturally closed state, reliable germicidal forces at work. Taking these facts into consideration, with that of the closed canal of the cervix through its mucus, we see the provision made by nature against septicæmic processes in the genital tract.

2. **Staphylococcus Pyogenes Aureus.**—This micro-organism is frequently found in suppurative discharges, and is perhaps most commonly met with. It is generally found associated with other bacteria of the same group, and is more virulent than the staphylococcus pyogenes albus, or citreus. The staphylococcus pyogenes aureus occurs in masses of cocci in groups, more rarely singly, or in short chains.

3. **Streptococcus Pyogenes.**—The streptococci is another most virulent organism, its name being familiar to surgeons as associated with erysipelatous inflammation, peritonitis, and puerperal septicæmia. The cell elements of the streptococci are larger than those of the staphylococci, and occur in chains, either in groups or in single rows; and it would appear, from experiments such as those of Marmorek and others, that the relative virulence of this organism may be due to its method of cultivation. It does not appear that bacteriologists have as yet satisfied themselves as to the various causes which influence the different forms of staphylococci and streptococci in their

comparative and relative degrees of virulence. The practical surgeon is ever mindful of the fact that where suppurative and septicæmic processes arise and spread, such origin and dissemination are found associated with their presence. He has also to realize that the danger arises from an inappreciable quantity of the infective material. A few germs are sufficient to produce the mischief and bring about such pathogenic conditions as will destroy life. It is many years since Koch showed that a trillionth part of a drop of dried septicæmic blood, taken from a mouse infected with anthrax, and preserved hermetically for a considerable time, was sufficient, when in solution, to produce septicæmia in a healthy mouse. What amount of poison, then, a surgeon may carry in the handy receptacle of an unpared nail, those who would differentiate for us between the "grosser" and "lesser" degrees of septic material on the hands or person of an operator can best compute.

4. Tubercle Bacilli.—Now that primary tubercle of the uterus, Fallopian tube, and ovary has been proved to occur, and that tubercular disease has been shown frequently to invade both the uterus and adnexa, the isolation of the tubercle bacillus, and its recognition in the genital tract, is of supreme importance to the gynæcologist. This will have to be referred to several times in dealing with the question of tuberculosis. The morphological features of the tubercle bacillus are well known.

5. Micrococcus Gonorrhœa, or the Gonococcus of Neisser.—It is essential that every practitioner should know the characteristics of this organism. In shape it has been described as like two buns with their flat bases facing each other; but this arrangement of pairs, in double chain or otherwise, is not characteristic of this diplococcus, for others occur of the same shape in healthy vaginal mucus and in the lochia. Its occurrence in a purulent discharge, in such groups or colonies, *lying free between the pus cells, or lodged within the pus cell itself*, is its most characteristic feature. *It does not stain by Gram's method.* It requires a fresh blood medium, and a temperature of the blood, to grow. If the gonorrhœal pus be mixed with uncoagulated serum, and the mixture be added to two parts of melted agar, at a temperature of 40° to 45° C., and this be then allowed to solidify obliquely in the tube, the gonococcus will be cultivated.* Newman states that it is possible to sub-culture on ordinary media from such cultures. Other methods have been recommended, and will be found in text-books on bacteriology. The lower animals do not take this disease by inoculation. The relation of the gonococcus to pyo-salpinx, and the association of gonorrhœal infection with syphilis, and the relation of both to pelvic inflammation, will be referred to when we are dealing with these latter.

Bacillus Coli Communis.—This bacillus is, as Hewlett observes, one of the most widely distributed organisms in nature, being aerobic, and facultative anaerobic. It is a short rod with rounded ends 2 or 3 millimetres long, and 0·4 to 0·6 millimetres broad, frequently linked in pairs or more. It varies somewhat in size and shape, is feebly motile, and possesses lateral flagellæ to the number of from two to ten. It occurs commonly in the intestinal tract of men and animals (Hewlett). It can be readily isolated and cultivated from fæces. It is known by several distinguishing morphological and culture

* *British Gynæcological Journal*, May, 1898.

peculiarities from the bacillus typhosus. Pathogenic in its action, it causes death when introduced into the circulation in variable periods of time, and has a toxæmic effect when introduced into the peritoneal cavity. Its chief interest to the gynæcologist lies in the fact that it is the organism of which he is most fearful as the cause of peritonitis when there has been any bowel infection, either primarily through traumatic causes in operation, or secondarily from infection from the contiguous intestine in suppurative pelvic states demanding operation, which are apt to involve the rectum on the one side, or the appendix on the other. The most important pathological point is that the bacillus may find its way through the intestinal tunics when these have been injured, but not perforated.

Found likewise in the lungs and pleural cavities, it may explain those cases of septic pleuro-pneumonia which occur occasionally as sequelæ of pelvic and intestinal operations.

Stroganoff still maintains that the cervix of both pregnant and unpregnant healthy women does not usually contain microbes—that the region of the external os defines the boundary between the microbe-bearing and non-bearing regions, and that the cervical mucus destroys microbes.

Fuerbringer and Freyhau* have repeated the experiments of Ahlfeld, Reinicke, and Poten, and have come to the conclusion that the bactericidal property of alcohol in combination with corrosive sublimate is due to the removal of the fat from the skin of the hands, while its power of uniting with water renders disinfection of the tissues easy by the associated sublimate, or its subsequent solution, at the same time that the squamous epithelium and the superficial impurities, as well as the bacilli, are removed.

Micro-organisms in the Endometrium.

Ernest Laplace, Philadelphia, as the result of a series of important experiments in Koch's laboratory, says, 'These experiments proved that in the normal endometrium numerous organisms were present, which do not want any air, inasmuch as they are quite on the surface. In endocervicitis the *Streptococcus*, *Pyogenes Aureus*, *Albus*, and *Citreus*, with *Bacillus Pyocyaneus*, were found.

'The results of the experiments proved :—

'1. The normal endometrium of uterus and cervix is a harbour for vast numbers of micro-organisms, most of which are known to us, but some still unknown, and possessing poisonous qualities for guinea-pigs.

'2. The inflamed endometrium contains the same kinds of micro-organisms, but in vaster quantities, the superficial exfoliating cells also containing them.

'3. In chronic endometritis the secretions contain about as many infectious organisms, the mucous membrane and fibrous tissue becoming greatly hypertrophied under the continued development of these organisms, and whether this chronic condition be simple or gonorrhœal, we find the germs both in the epithelium and fibrous tissue.

'It now becomes necessary to explain how these organisms get to the deeper parts, and how far their relations as a *cause* of the inflammation extend.

* 'Deutsche Med. Woschen,' 1897.

It is plain that the mere presence of the micro-organisms does not suffice to constitute disease. Disease is the reaction upon the system—local or general, or both—resulting from the *developing* organism. In the uterus the normal secretions are a *poor* culture medium for germ life, and at the same time keep the micro-organisms at a distance from the blood-vessels. If given the proper opportunity, however, and furnished with blood or serum retained any undue length of time within the uterine cavity, micro-organisms develop therein with as remarkable rapidity as they do upon artificial culture media in the laboratory. Now the conditions will have changed, and enormous hordes of bacteria soon develop from those already present, and infect the tissues. Judging from the reaction of tissues under the influence of developing bacteria elsewhere, we should say that cold is, perhaps, the most frequent cause of the initial process; the congestion which soon follows the action of cold upon the tissues being familiar to us all. Next follows the exudation of serum, which is soon contaminated by the bacteria in the neighbourhood; these finding their most favourable soil develop rapidly, producing a chemical irritant or ptomaine which is the decomposition of the serum incident to their growth; this acts as a direct chemical irritant which keeps up indefinitely the irritated condition of congestion, and hence hypernutrition of superficial cells, proliferation of cells resulting, which cells naturally find their protoplasm inoculated from the first with the bacteria under whose impulse they developed.

In the chronic form, with hyperplasia of fibrous tissue, there seems no explanation save that the original infection took place as above described, and that, either from neglect or other causes, the parts have become so irritated that the deeper fibrous tissue, under constant congestion, became infiltrated with white blood corpuscles by diapedesis, which gradually built new fibrous tissue, dovetailing with that already existing.

Simply from a histological and pathological standpoint, inasmuch as the foundation of treatment in disease is the removal of the cause, finding that these micro-organisms exist nearly always to a certain depth, curetting is the rational treatment—removal of all the diseased cells through which we could not expect an antiseptic to act. Thorough scraping being done, it but remains to so sterilize the regenerating mucous membrane as to leave it uncontaminated. Here the acid sublimate solution finds a happy application in the strength of 1 in 2000 to 1 in 5000.*

Richelot emphasizes the fact that, side by side with any aseptic or antiseptic methods, there must be complete technique on the part of the surgeon and those engaged in the operation, exact hæmostasis, and complete anæsthesia. The longer the operation the greater the chance of infection; but, he is careful to add, rapidity of execution should not supersede prudence in operation. A bungling operative procedure may neutralize our aseptic precautions. The more the vitality of our patient is interfered with by disease, the greater need there is for dexterity of execution and attention to detail in operation. The continual effort, says Richelot, to perfect asepsis, 'has developed the most admirable results.' If we cannot destroy the existence of bacteria, we may at least prevent ourselves from carrying infection to our patient.

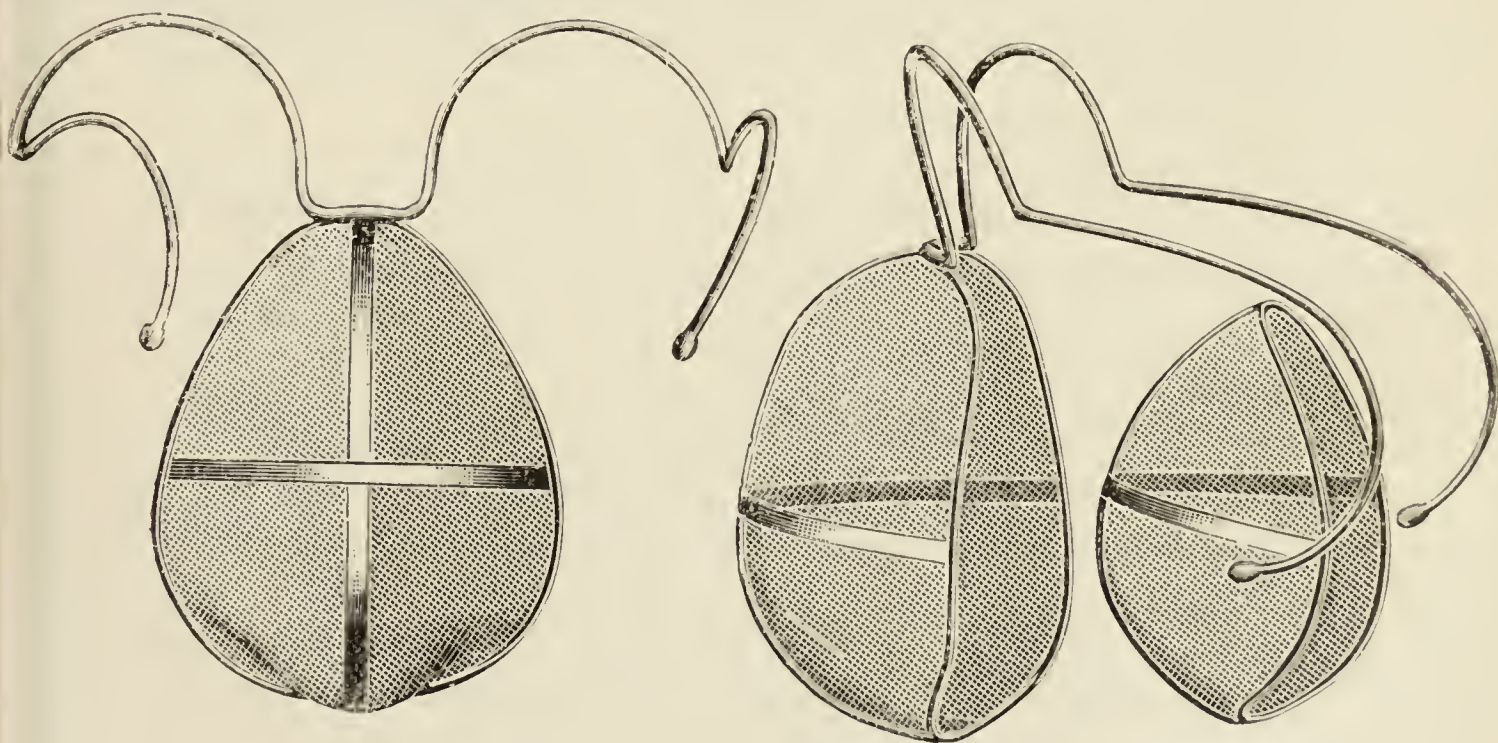
* *American Journal of Medical Science*, Oct., 1892.

The Peritoneum.—We may take it that the peritoneum is endowed by bactericidal qualities which are increased in direct ratio to its power of absorption. Irritation of the peritoneum by chemicals predisposes to peritonitis and sepsis, as also does the presence of stagnant fluid or a blood-clot in the peritoneal cavity. Ascites predisposes to peritonitis and sepsis by the prevention of absorption, and by the culture medium which the ascitic fluid furnishes.

Kelly lays emphasis on the investigations of Muscatello (*Virchow's Archiv*, 1895), which show that an intra-peritoneal current carries fluids and small particles towards the diaphragm, and that the rapidity or otherwise of the current is influenced by gravity. Such particles pass through the lymph spaces of the diaphragm and thence into the lymphatic vessels and glands, from whence they reach the blood.

From the blood such solid particles are deposited in the collecting glands of each organ. Kelly, from Muscatello's experiments, regards the elevated posture as a prophylactic against peritonitis. This fact, as we show elsewhere, also bears on the post-operative treatment of abdominal cœliotomy.

The Saliva of the Operator a Source of Infection.—Mendes de Leon, in a recent communication,* showed by conclusive experiments that small particles of salivary secretion were emitted from the mouth of the operator in ordinary speech. Such fine particles contained streptococci and staphylococci—hence the danger arising from the operator speaking directly over a wound during operation. This is met in some clinics by the use of masks, or, as Mendes de Leon suggests, a nickel mouthpiece like an inhaler containing cotton wool.



FIGS. 108a, 108b.—ASEPTIC MASK OF AUTHOR.

It consists of two naso-oral pieces. The inside is removable so as to permit of sterilized gauze being inserted. It is very light, and in no way interferes with speech or respiration. It can also be had with an occipito-frontal spring.

* *Brit. Gyn. Soc.*, Jan., 1904.

CHAPTER V.

SOME MINOR GYNÆCOLOGICAL OPERATIONS.

Applying Nitric Acid to the Cavity of the Uterus.—This is a simple step that any intelligent practitioner should be able to take in chronic cases of endometritis and subinvolution which must occasionally come under his care. When efficiently carried out, it is a safe therapeutical measure. Of recent years, however, I prefer curettage and the application of chromic acid.

It is a step which should be avoided immediately before or after a period. It is well also in all operations on the uterus or ovaries to secure such mental rest and quiet as we can, and to subdue any morbid excitement of the nervous system generally. For this purpose bromide of ammonium or bromide of potassium may be given for a few nights before operating. The secretions should be seen to, and the rectum, if necessary, emptied by an enema on the morning of any operative interference.

The uterine canal having been previously dilated, the instruments we require are—a duck-bill speculum, a few uterine wool-holders, and retractors. We have also fuming nitric acid, vaseline, glycerine, and some absorbent cotton-wool at hand. An assistant or nurse is indispensable.

The woman is placed in the semi-prone or lithotomy position, and brought well to the edge of the table opposite a good light. Sims' speculum is introduced, and the uterus is steadied and drawn well into view *with a hook or tenaculum*. A thin layer of cotton-wool has previously been rolled tightly round one of the platinum probes to the extent of about two inches. The sides of the vagina and the vulva are carefully protected, and are drawn to either side with retractors. Any bleeding that may occur having been arrested, the probe is now dipped lightly in the acid, and it is a good plan to roll it on the side of the slice so as to press out any superfluous moisture. It is then carried to the fundus, and cautiously withdrawn so as not to touch the soft parts.

If the uterine canal be thoroughly dilated and dried, the use of an intra-uterine cannula, such as that of Atthill, may be dispensed with. A second uterine probe is ready charged with some vaseline



FIG. 109.—EXACT SIZE OF HOLDER COVERED WITH THE WOOL.

which it is well to pass after the acid has been applied to the fundus uteri. It helps to prevent adhesions. A tampon of moistened



FIG. 110.—ROUGHENED END OF WOOL-HOLDER.

iodoform gauze is placed in the vagina. The patient should remain in bed and have the vagina dressed each day; any discharge must



FIG. 111.—HALL'S LANCET.

be carefully wiped away, and a fresh tampon placed in the vagina. These same directions apply to the use of a strong chromic acid solution.

Depletion of the Cervix Uteri.—For this purpose the cervix uteri is exposed with a good-sized tubular speculum, the patient lying on her back. With a Hall's lancet (a set of different sizes in a small case may be had) some punctures, according to the quantity of blood we require to take, are made in the cervix and the neighbourhood of the os uteri. A speculum slice is slipped under the lip of the speculum, and the blood is permitted to run into it. I believe rather in occasional depletion than in the abstraction of a large quantity of blood at one time. It is better not to make these punctures too freely. Otherwise, and in the absence of efficient tamponing, awkward bleeding may occur, and serious syncope follow.

When sufficient blood has been drawn, it is easy to stop any further loss by plugs of dry wool pressed up through the speculum

against the cervix uteri. The vagina is tamponed temporarily with some gauze. It is well to deplete, especially in a case of congestive dysmenorrhœa, shortly before the advent of a period.

Aspiration.—When an aspirator is used for therapeutical purposes, I prefer the larger needles, as shown in Fig. 74. The aspirator I have been using for years, and which I have found most convenient, is that of Matthews (Fig. 73). The needle-points are protected after insertion by a cannula; the piston also completely prevents the admission of air.

The Actual Cautery.—There is no appliance to surpass for general use the benzoline cautery of Paquelin. It is available also for cutting purposes, growths, small tumours, vascular excrescences, malignant disease of the uterus, amputation of the cervical neck, perforation of a fibroid tumour of the uterus, and hæmorrhoids.

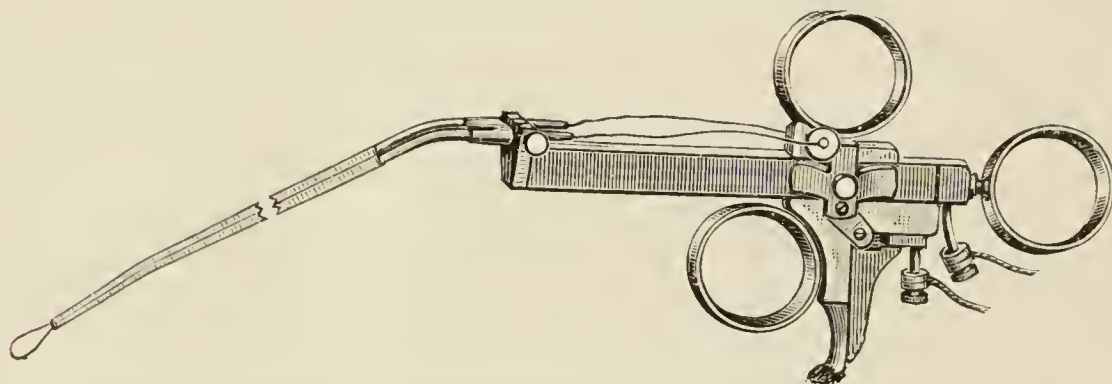


FIG. 112.—SATTLER-NIEDEN UNIVERSAL CAUTERY HANDLE, WITH SNARE.

For very small tumours and for operation on the urethra, the galvano-cautery answers admirably. Fine platinum points can be obtained of any shape. All instrument-makers now furnish portable cautery batteries. Porcelain cautery points can also be had if required.



FIG. 113.—PORCELAIN CAUTERY.

Division of the Cervix alone.—If the cervical canal has to be cut the only operation that affords any permanent relief is that in which the internal os is also divided. It must be remembered that even with this simple step it is necessary to adopt every aseptic precaution. The rectum is cleared before operation, and the vagina carefully sterilized. The dorsal position is chosen; the uterus is drawn well into view and held by a tenaculum. Küchenmeister's scissors is used. One blade is carried to the internal os, and the

cervix is divided at one side. This division is repeated at the opposite side. This is simple division of the cervix. It is a step which, taken alone, is seldom indicated. The operator must see thoroughly how far he is cutting, and the extent of introduction of the blade.

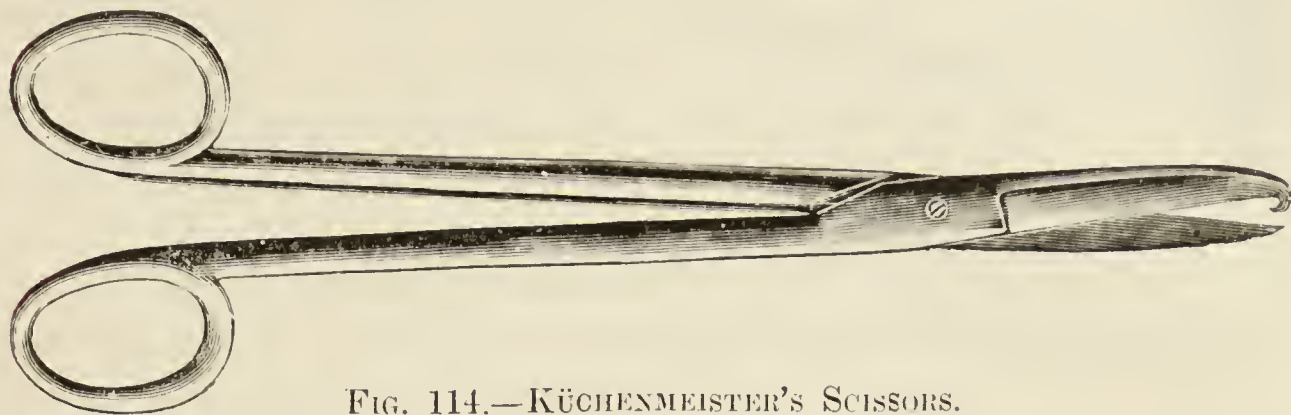


FIG. 114.—KÜCHENMEISTER'S SCISSORS.

Division of the Internal Os.*—In cases of sterility where dilatation has failed, in severe endometritis with dysmenorrhœa, and in spasmodic dysmenorrhœa, division of the cervix uteri and internal os is indicated. It must be remembered that we are more likely to have hæmorrhage from the uterine vessels; we are closer to the peritoneum; there is a greater risk of metritis, and there is more immediate shock to the woman. Every precaution taken in the simpler operation is adopted in this. The instrument I prefer is

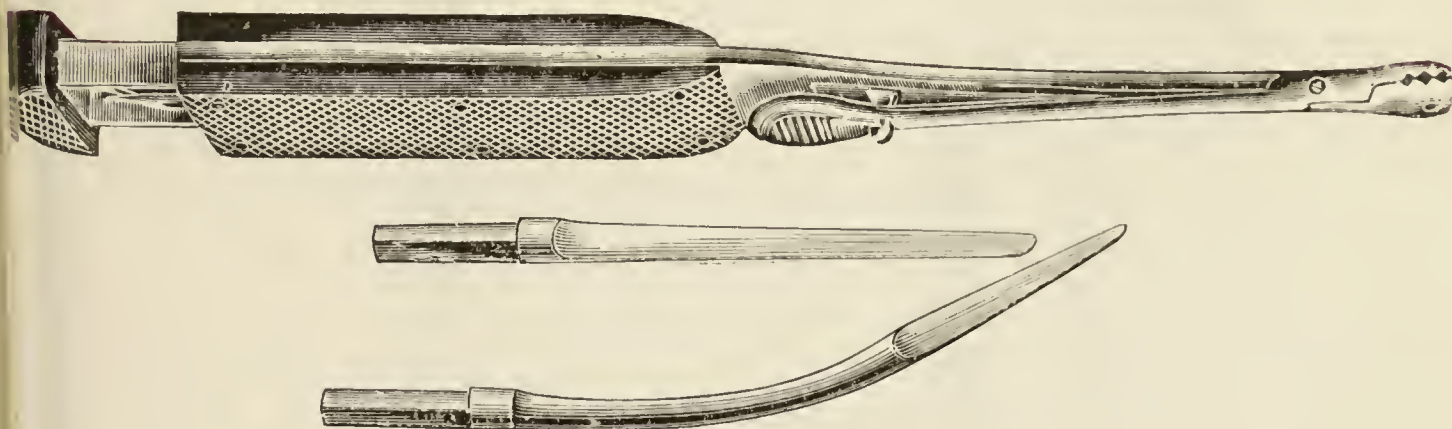


FIG. 115.—MARION SIMS' KNIFE.

Blades (natural size) contained in the handle.

a Sims' knife. The blunt-pointed, straight, and curved blades are carried in the handle, and can be adjusted at any angle to its long axis. The preliminary steps are those taken for division of the cervix. The knife is then passed through the cervix uteri and internal os, the incisions being carried laterally or crucially. The posterior incision, with the exsection of a small triangular portion of the neck of the uterus, as suggested by Sims, has the great

* This operation is more fully referred to in the chapter on dysmenorrhœa and stenosis.

advantage that it places the axis of the patient's uterine canal in the most favourable position for conception. This is still more

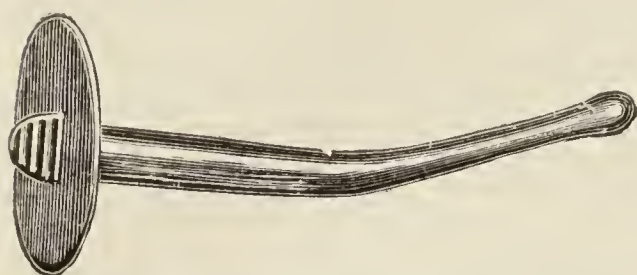


FIG. 116.—AUTHOR'S CELLULOID-WIRE STEM.* (ARNOLD.)

apparent if there be an ante-flexion associated with the sterility. After the uterine isthmus is divided, a medium-sized dilator is passed into the cavity of the fundus. Bleeding is arrested by carrying small strips of sterilized gauze into the cavity, and finally, a strip of sterilized iodoform gauze is left in, and the vagina tamponed as after curettage. These tampons are removed after 48 hours. The only stems I use, and these seldom, are those of glass as advised by Sims, or, what I prefer, my celluloid and

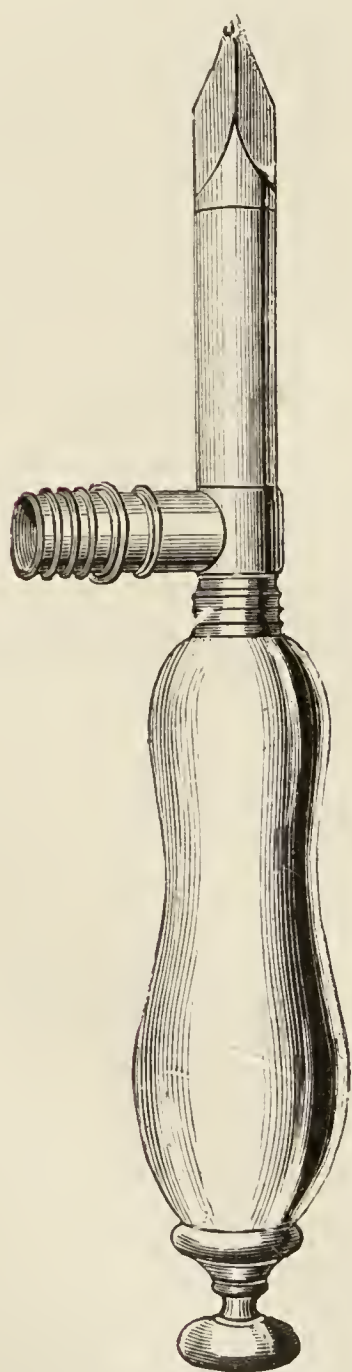


FIG. 117.—SYPHON TROCAR OF SIR SPENCER WELLS.



FIG. 118.—TROCAR AND CANNULA FOR EMPTYING LARGE CYSTS OR FOR USE IN OVARIOTOMY.

* This can be moulded to any shape, and by means of a loop of Chinese silk passed through a hole in the short handle of the stem it can be readily withdrawn by the nurse or the patient herself.

wire stems (Fig. 116). No precaution must be omitted, after incising the cervix, against exertion, cold, coitus, or septic contagion. It is better to keep the canal open with one of the stems here suggested.

Paracentesis Abdominis.—This is an operative measure sometimes demanded—

- (a) For purposes of diagnosis (ambiguous cases) ;
- (b) Where the operation of ovariectomy is contra-indicated, to prolong life ;
- (c) As a palliative measure, to gain time in certain cases, and to afford temporary relief ;
- (d) In some cases where pregnancy or ascites complicates ovarian dropsy.

It has to be remembered that simple tapping of an ovarian cyst has been followed by death from shock, peritonitis, the escape of cyst contents, or blood escaping into the peritoneal cavity, and septicæmia. Therefore it is well, in preparing to tap, that we should decide beforehand clearly with what object the step is taken. *Rarely is it justified in ovarian cystoma.* If our desire be to assist the diagnosis, then I prefer the aspirator (Fig. 73). The rod in the needle prevents the admission of air. Such a needle will possibly empty even a large cyst. If we have a doubt as to the nature of the fluid, while, at the same time, we are anxious to tap the cyst, the trocar of Spencer Wells is an admirable instrument (Fig. 117).^{*} The larger the bore of the trocar, the safer it is in all such cases. One of the most awkward accidents of paracentesis is the clogging of the tube with semi-solid material, and the escape of cystic fluid as a consequence into the peritoneal cavity. Having decided to tap, we prepare our patient by attention to the secretions, giving a dose of bromide of potassium on the night previous to the operation. Immediately before it the urine is drawn off by an assistant. Save to allay nervousness, an anæsthetic is not necessary. Chlorethyl spray, or, if this is not at hand, anæsthetic ether sprayed on the site of the small preliminary incision, or the application of a lump of ice, the end of which has been dipped in a little salt, will deaden the sensibility (Goodell). It is better, if possible, to select the linea alba. It is the exception when we are compelled to make the puncture elsewhere, through the accident of some solid matter occupying the position of the median line. The abdomen having been thoroughly cleansed, may be embraced in a split roller. This is drawn tighter as the fluid escapes, and it serves to support the

^{*} Also Kœberlé's trocar, p. 118.

abdominal wall during the emptying of the sac and the removal of the pressure from the great vessels. The woman is brought well to the edge of the bed, the abdomen projecting over it. A bucket containing a little water is at hand to receive the contents of the cyst, so that the end of the tube attached to the trocar may dip below the surface, and thus the admission of air be prevented. A small incision is now made over the linea alba, in the abdominal

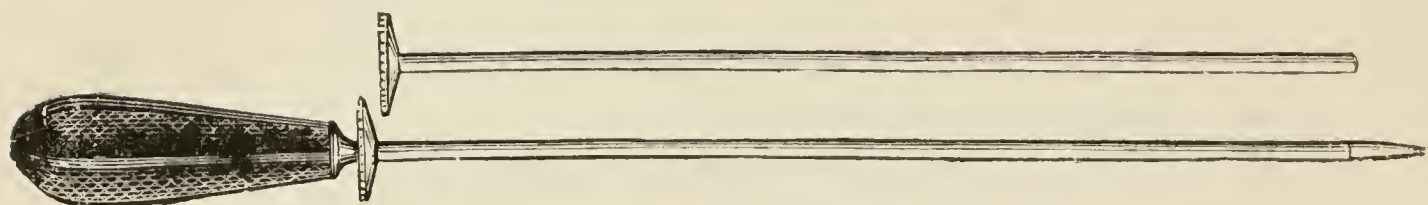


FIG. 119.—FINE ASPIRATING TROCAR AND CANNULA.

integument, midway between the pubes and umbilicus, and the sterilized trocar is plunged into the cyst. If it be a polycyst, the trocar may be made to pierce the other cysts without withdrawal. When the fluid has ceased running, extra caution must be exercised in preventing the admission of air, or any fluid likely to excite inflammation.

The wound is closed with dry antiseptic dressing. If the incision should have been made too large, a silver-wire suture should be inserted.

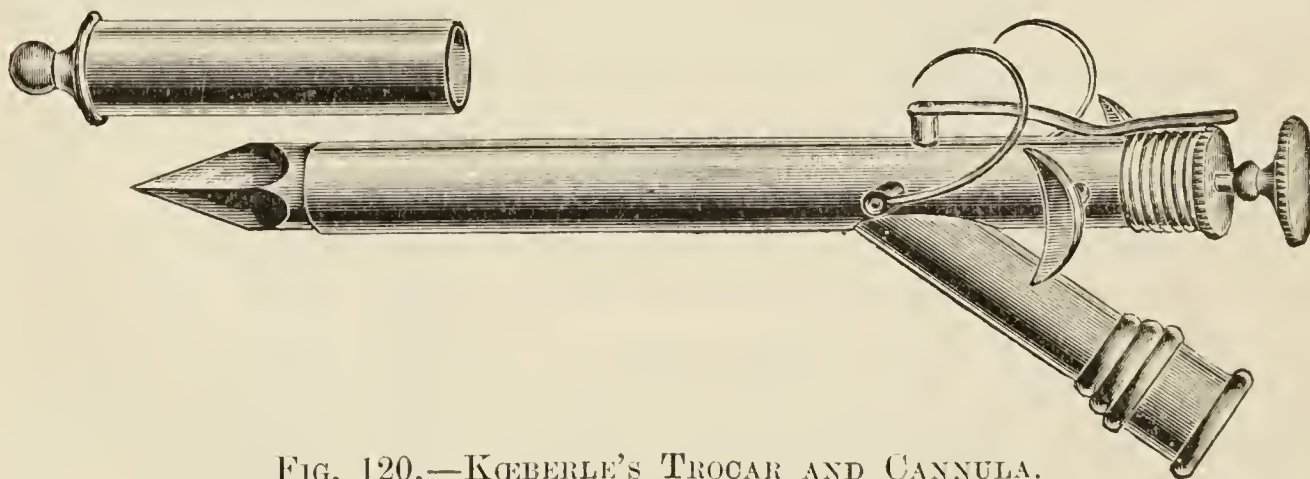


FIG. 120.—KOEBERLE'S TROCAR AND CANNULA.

The hooks are sheathed when not required. They serve to hold the cannula to the cyst walls.

The prepared thymol or iodoform pads will be found most convenient to lay over the wound after all such operations. The same care should be exercised to anticipate peritoneal inflammation after paracentesis as after the more formidable operations of abdominal section.

Vaginal Punction.*—It may be necessary to remove fluid from a cyst, ovarian or other, by the vagina. A small cyst may be localized in the pelvis, occupying Douglas' space. In a multilocular cyst the solid part may be above, and the fluid cysts distend the lower portion

* Consult chapter on 'Perimetritis and Pelvic Suppuration.'

of the tumour. *All the dangers of peritonitis and septicæmia are to be guarded against in vaginal paracentesis.* The vagina has to be previously prepared as already described (chap. iv. p. 129), and all instruments used are sterilized. It is preferable, as a rule, to use an aspirator; otherwise, a long curved rectal trocar, or, still better, the small guarded ovarian trocar of Spencer Wells, must be chosen, with a tube attached, the lower end of which can pass into some fluid in a vessel at the side of the bed. The most perfect instrument for exploring cyst cavities and pelvic accumulations is the exploring trocar and cannula with branched dilator of Landau (Fig. 121). The patient is best placed in the lithotomy position. The rectum and bladder (as in all operative procedures on the pelvic viscera) are first emptied. A careful and final exploration of the pelvic organs is made. The most prominent part of the tumour is felt, where we

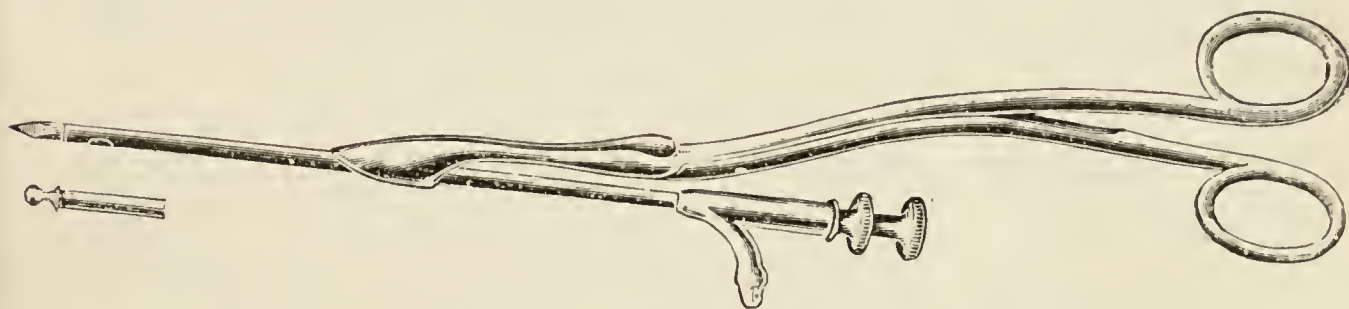


FIG. 121.—TROCAR AND DILATOR FOR PELVIC ABSCESS.

The trocar and cannula run in a groove between the blades of the sharp-pointed dilator. Having, with the trocar, determined the presence of pus, the closed blades of the dilator are pushed on into the cavity, and these are then separated so as to permit of the enlargement of the opening and the full flow of fluid.

find the most distinct sense of fluctuation, and the trocar is guided to this spot by the middle and index fingers of the left hand. The bulging portion is now pierced with the trocar, which is then withdrawn, and the fluid is permitted to flow off by the cannula and tube. There should be no meddling after the withdrawal of the fluid. Sterilized iodoform gauze is used for tamponing the vagina. The greatest care is necessary for several days. The patient is kept on her back and the pulse and temperature are watched. The bladder must be regularly relieved by the catheter, and it is well to keep the bowel quiet for a few days.

If it be decided to remove any clots, either from the quantity of these in the tumour or the symptoms of septicæmia being imminent, we must determine our site of puncture according to the character of the swelling and the situation of its most prominent surface. The posterior cul-de-sac of the vagina will be found the

most suitable and convenient place to explore. An aspirator or Landau's instrument should first be used. If we be deceived in the sense of fluctuation, and find either a smaller quantity of fluid than we anticipated, or only softened clots—or that no fluid comes with the aspirator—the question immediately arises, should we not lay open the mass and remove the clots? The decision must depend on the urgency of the local or general symptoms—pelvic distress in the bladder and rectum on the one hand, symptoms of septicæmia on the other. It is impossible to lay down dogmatic rules for guidance in such cases. Each individual case has its special peculiarities and bearings.*

The frequency with which tubal pregnancy is the cause of the effusion has to be always remembered. *Abdominal section is here the clear indication.* Having evacuated the contents of the tumour, 1 in 1000 of formalin is used to wash out the cavity through a piece of tubing attached to the nozzle of an ordinary syringe or the cannula of the aspirator. Drainage is maintained if necessary by sterilized iodoform gauze, and the same is used as a loose tampon in the vagina.

Intra-uterine Medication.—In gynæcological practice the treatment of uterine discharges by the topical application of agents to the uterine canal, both of cervix and body, is not so often practised as it used to be, since the operation of curettage has become so frequent. In the commonly occurring troubles—endometritis (cervical and corporeal), granular and follicular conditions of the cervical canal, discharges consequent upon gonorrhœa—we may have to make applications to the interior of the uterus. The following are some of the more important therapeutic agents employed:—

Nitric acid.

Carbolic acid.

Chromic acid.

Iodoform and iodol.

Iodine (as tincture or liniment).

Ichthyol, 10 to 20 per cent.
solution, used alone or with
glycerine.

Iodine and carbolic acid.

Nitrate of silver (solid and in
solution).

Sulphate of zinc (solid and in
solution).

Perchloride of iron (in solution).

Trichloro-acetic acid (in solution).

To be used with the same
caution as nitric acid, and the
application restricted to a
limited surface.

Chloride of zinc (in solution).

Hydrastis Canadensis (liquid
extract).

* See chapter on Pelvic Hæmorrhage.

Mercury, cocaine, belladonna, and morphia, are best applied in the form of bougies.

I have found the liquid extract of hydrastis combined with glycerine, carbolic acid, or liniment of iodine, an admirable application in cases of cervicitis and erosion of the cervix. I can say the same of ichthyol.

Intra-uterine medication is practised either through the medium of solid substances, the introduction of ointments, or the application and injection of liquids. These are applied to the cervix alone, or to the cavity of the body of the uterus above the cervix.

While many women are insusceptible to the effects of intra-uterine applications, others, on the contrary, are very easily affected by such, and are peculiarly prone to suffer from uterine colic, symptoms of collapse, metritis, or peritonitis, after their use. Intra-uterine medication, then, is always to be undertaken cautiously. Before resorting to it, the woman must be placed in the best possible position to undergo this form of treatment. This caution is all the more necessary in the instance of those applications which are made above the os internum. Certain general precautions are applicable in such cases. I state these categorically.

General Precautions.

Let the vagina be thoroughly cleansed. Have the patient's bowels attended to by the administration of a saline purgative; rest in bed is essential where a powerful agent is carried beyond the isthmus uteri. Sufficient patency of the uterine canal should be secured before we proceed to treatment. When any caustic or strong astringent has been used, an antiseptic tampon should be placed in the vagina. This is the more requisite if the step be taken in the practitioner's house, and if the patient has to drive or walk any distance subsequently. No application should be made *immediately* before or after a menstrual period. The safest, most convenient and effectual method of applying any remedy to the canal of the uterus is by means of the uterine cotton-wool holder. The probe can be curved to any shape, so as to pass readily into the uterus. It is well to have two holders, as one is necessary to clean out the uterus. This is readily done by rolling a layer of cotton-wool tightly round the end of the probe, and wiping out the uterus

with it. At times a difficulty is experienced in removing the tenacious plug that fills the cervix in some cases of endometritis. By placing a little more wool on the probe, and rotating, we may detach it; but a small conical sponge, held in a miniature sponge-holder, will answer the purpose best.

When about to dress the uterus in the manner spoken of, it is well to have the patient on a couch in front of a good light. The dorsal decubitus is the most convenient. [I have already alluded to the mode of applying nitric acid to the fundus uteri.] One tampon of wool is ready to hand, and some half-dozen small pieces are prepared to wipe the vaginal roof and surface of the uterus. The cervical canal is cleaned out and dried, and the uterine probe, armed with the cotton-wool saturated with the solution, is carried the desired length into the uterus. When the probe is withdrawn, the vaginal tampon is introduced.

Of the substances named, the strength of any solution selected must depend on the character of the case and the effect we desire to produce. The safest rule for a surgeon to follow is to select a medium strength of any medicament, and never to begin with the maximum of that recommended. On the whole, it is better to be below than above even the medium strength of some solutions. The subjoined are those that, as a rule, will be found safe and serviceable:—

1. Nitric acid (applied as directed, p. 142), pure.
2. Carbolic acid and glycerine two parts to one, and equal parts. (Extract of hydrastis, one part, may be added.)
3. Carbolic acid, glycerine, and tincture of iodine: equal parts, or combined with extract of hydrastis.
4. Carbolic acid and ext. hamamelis (liq.): equal parts.
5. Chromic acid: gr. xx.—xxx. ad ʒi.; or the same solution with equal parts of glycerine.
6. Iodine: gr. xxx.; spt. rectif., ad ʒi.; or tincture, with equal parts of glycerine; or the liniment of iodine—pure.
7. Nitrate of silver: gr. xx.—xxx. ad ʒi.
8. Perchloride of iron: gr. xx.—xxx. ad ʒi. (glycerine or water), with one part of No. 2 Solution.
9. Sulphate of zinc: gr. xxx. ad ʒi.; or with one part of No. 2 Solution.
10. Chloride of zinc: gr. xxx. ad ʒi.; or with one part of No. 2 Solution.
11. Ichthyol solution 10 to 20 per cent., or with Nos. 2 or 6.
12. Formic aldehyde $\frac{1}{3}$ th to 1 per cent. It is a good plan in periodical dressings to vary the nature of the application. A desired effect will often follow this change in topical treatment.

Intra-uterine Injection.—*I never resort to intra-uterine medicated injections into the cavity of the uterus.* I do not care to run the unquestionable risks attendant upon their employment. The less fluid we leave in the

uterine cavity after any topical application, the better. This applies with double force to the undilated organ when metritis, peritonitis, collapse, colic, cellulitis, and perimetritis are more likely to follow the injection of fluids. If they be used, it should be with such an instrument as the urethral injector of Sir Henry Thompson. Such an intra-uterine medicator I had made for me. It has a uterine curve, and answered well for introducing fluids. It contains a sponge, moistened with the solution, which is carried down to the apertures in the curve of the instrument, and thus a small quantity can be squeezed through these into the urethral or uterine canal. Withdrawing the sponge lightly, we can permit the reflux of any fluid that may remain, before removing the instrument. I, however, see no advantage to be gained over the application with the uterine probe and saturated wool. If intra-uterine injections be used, we must be careful to—

- (1) exclude the possibility of any flexion of the canal;
- (2) secure free exit for any fluid by previous dilatation of the canal;
- (3) inject (the patient being in bed) within a week *after* the menstrual period, and take every possible precaution to anticipate and prevent *subsequent* inflammation;
- (4) avoid the admission of air;
- (5) never use nitrate of silver solution by injection;
- (6) first wash out the uterus with a little warm water, to ascertain the uterine sensitiveness.

Tincture of iodine, diluted; carbolic acid, with glycerine and water; perchloride of iron, in water; chromic acid, in solution; sulphate and chloride of zinc, in water—have all been used. The strengths should be weaker than those we employ of the same agents with the cotton wool and probe.

A fairly safe injector to use is a small glass syringe which fits accurately to a hollow uterine sound with fine apertures at the point. Whatever fluid be employed, at the most only five to ten drops should be injected at the time. I repeat that in practice I believe *intra-uterine injection to be a needlessly venturesome plan* of treating unhealthy endometric conditions.

I never now use any ointment in intra-uterine therapeutics.

Intra-uterine Crayons and Bougies.—Fused sticks are sold for the purpose—as those of Braxton Hicks, which are made of sulphate of zinc. I have altogether abandoned the use of all such crayons and bougies. With the *porte-caustique* bougies of iodol, iodoform, cocaine, belladonna, iodide of mercury, and eucrophene may be introduced. Nitrate of silver is used in combination with nitrate of potash made into small moulds, or it may be readily fused in a little platinum crucible, and applied on the point of a uterine probe.

Many years since, Lombe Atthill advocated intra-uterine application of the solid nitrate of silver in sub-involution of the womb, attended by severe menorrhagia, regarding it as ‘both simple and safe.’ These substances are applied through the *porte-caustique* (Fig. 122), a hollow uterine sound open

at the end. The little caustic stick is inserted into this, and pushed home into the uterus by the stylet, which fits the tube accurately. But we must be careful to withdraw the *porte-caustique* a little from the uterus when pushing in the stick, so as not to penetrate the uterine wall.

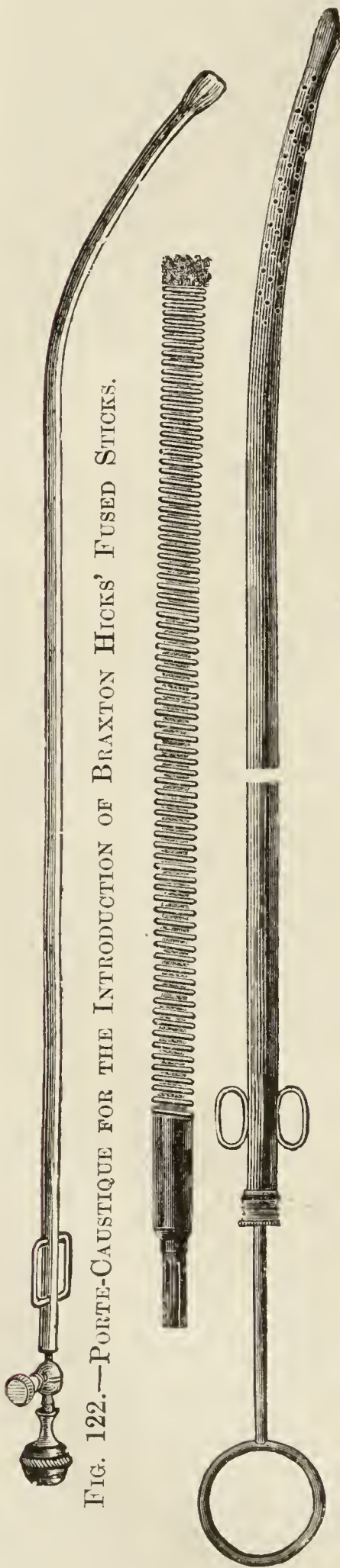


FIG. 122.—PORTE-CAUSTIQUE FOR THE INTRODUCTION OF BRAXTON HICKS' FUSED STICKS.

FIG. 123.—AUTHOR'S INTRA-UTERINE MEDICATOR.

Intra - uterine Suppositories. — Very small suppositories can be readily had to order from any good chemist, made of cacao-butter and glycerine, containing belladonna (gr. ii. of extract), morphia (gr. $\frac{1}{4}$ — $\frac{1}{2}$), carbolic acid (gr. ii.), iodoform (gr. iii.), tannic acid (gr. x.), and alum (gr. x.); these agents may be used either singly or in combination. To these we may add cocaine or eucaine (gr. ii.). They can be inserted through the *porte-caustique*. I do not recommend unctuous or greasy substances. I believe the safest, the most generally convenient, and the most efficacious means of treating abnormal states of the endometrium, short of curettage, is by the aid of the uterine cotton-wool holder.

Potassa Fusa and Potassa cum Calce. —Both these caustics, the former being the more deliquescent and powerful, are by some surgeons employed in malignant disease of the uterus. They require to be used with considerable caution. I do not myself now employ either of these agents. They are thus applied: The patient is placed in the dorsal position, with the legs drawn up and held apart. A large-sized Fergusson's speculum is introduced, and the cervix brought well within the tube. Some absorbent cotton-wool, saturated with vinegar, is packed round the lower part of the cervix, separating the rim of the speculum from the part to which the caustic has to be

applied. The pencil of caustic is now taken in the holder, and used

lightly or otherwise, according to the desired object. The more freely it is rubbed on, the greater the depth of tissue destroyed, and the larger the slough. A stream of vinegar and water is then directed on the part, the wool having been removed. A pledget



FIG. 124.—SMALL PLATINUM CRUCIBLE FOR FUSING NITRATE OF SILVER.

of cotton-wool, soaked in equal parts of vinegar, glycerine, and water, is now pushed up against the cervix, and allowed to remain in the vagina. Uterine pain is relieved by a subcutaneous injection of morphia, and a belladonna and morphia suppository introduced into the vagina.

[The method of applying chloride of zinc in solution or paste is described in the chapter dealing with the treatment of malignant disease of the uterus.]

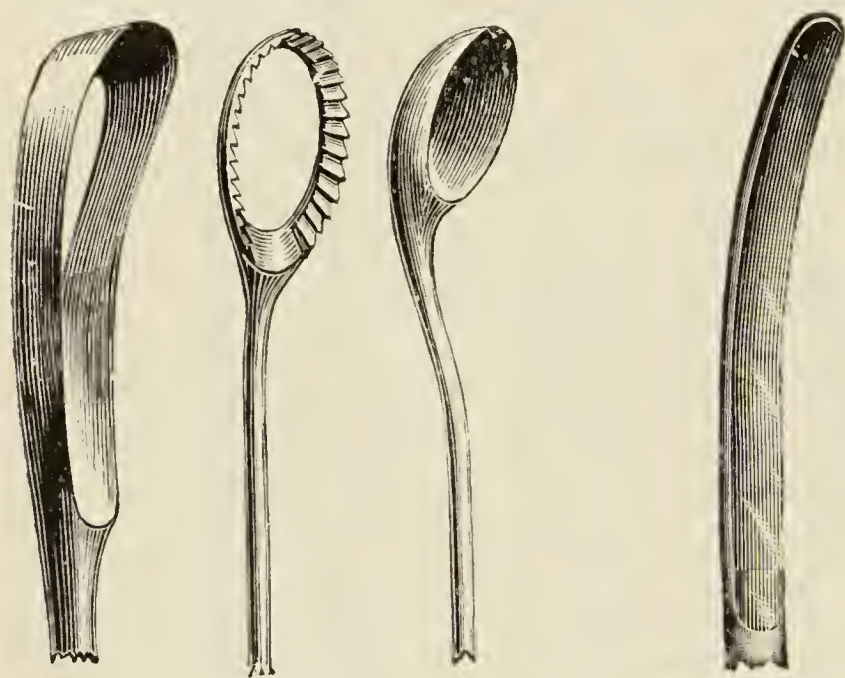
The Operation of Curettage.

The Use of the Uterine Curette.—The value of curettage of the uterus as a therapeutical step in diseased conditions of the endometrium cannot be too strongly insisted on. In chronic endometritis, in the case of fungosities of the cavity of the body, in granular endocervical conditions, in hæmorrhagic endometritis, in the instance of small mucous polypi attendant upon follicular degeneration of the endometrium, for placental polypi and the granulations which remain after adhesions following discharge of the ovum, in the case of soft growths which we are apprehensive are of a malignant nature, the use of the curette is indicated. Many of these states are attended with persistent or recurring hæmorrhage. Properly conducted curettage, completed by the application of chromic acid to the uterine cavity, has superseded, in my practice, all that tedious and unsatisfactory medication of unhealthy states of the endometrium which exhausts the patience of the surgeon and the confidence of the patient.

In the majority of operations of curettage *it is not necessary to dilate the cervical canal beforehand*, as it is already either sufficiently patent to admit a large-sized curette, or it can be made so at the time of operation by the use of dilators. In other cases in which there is more or less contracted isthmus, or in which we wish to explore the uterus digitally, as well as to curette it, previous

dilatation with laminaria tents is the plan I always adopt. I then take the following precautions :—

Previous Use of Antiseptic Tents.—Tents of different sizes are kept in a saturated solution of iodoform in ether (p. 81). They are taken direct from this solution for use. The vagina having been previously well douched with a lysoform solution and tamponed, the patient is placed on a table in the dorsal position. The duck-bill speculum is used. The uterus is drawn well down with a tenaculum. The vagina is now thoroughly douched out with an antiseptic. One or two tents (they should be from four to five inches in length) are selected and given the necessary curve. The uterus is steadied, and the tent or tents are pushed home. It is, as a rule, preferable to



Landau's curved knife is useful for final cleaning out of the uterine cavity when there has been much debris, also for the removal of granulations of the cervix and irregularities around the external os in cases of erosion.

FIG. 125. FIG. 126. FIG. 127. FIG. 128.—CURVED BLADE OF VARIOUS UTERINE CURETTES. LANDAU'S KNIFE.

Actual sizes.

The blade is $\frac{1}{4}$ inch wide.

introduce only a single tent at the first application. The vagina is now loosely tamponed with iodoform or chinosol gauze, and the patient is put to bed.

Supposing this application to be made in the morning, the dilatation needful for ordinary curettage will be secured by midday, or, if at night, by the following morning. Should further dilatation be required, as for exploration, the patient is again placed on the table, and, after the removal of the tampon and tents, the vagina is again thoroughly douched, and the cavity of the uterus is wiped out with $\frac{1}{5000}$ perchloride solution. The longer tent or tents are then introduced. I complete, at the time of operation, the needed dilatation with my larger-sized metal bougies or those of Leiter.

With such precautions, it is not, I believe, possible that any

septic effects can follow the use of tents. No bad consequence has ever attended upon any operation in my practice from this means of dilatation.

Operation.—The patient, having had an aperient the previous night, and an enema the following morning, is placed on the table, under an anæsthetic, in the usual dorsal position. The large duck-bill or other vaginal retractor is used to expose the uterus, which is drawn down with a tenaculum. If a tent has been used, this is



FIG. 129.—LIGHT METAL SPOON CURETTE.

withdrawn. The vagina is now thoroughly sterilized in the manner already described. A. Martin's curette (Fig. 130) is then taken and introduced as far as the fundus, and by rotatory movements the curettage of the cavity of the uterus is effected. This is continued as far as the cervix. The sharper curette (Fig. 125), or



FIG. 130.—A. MARTIN'S CURETTE.

other, as is deemed necessary, according to the character of the case and the size of the particles to be detached, is next introduced, and the denuding process is completed. I prefer, when we have reason to suspect products of conception, to use the large spoon curette (Fig. 127). The selection, however, will greatly depend on the resistance

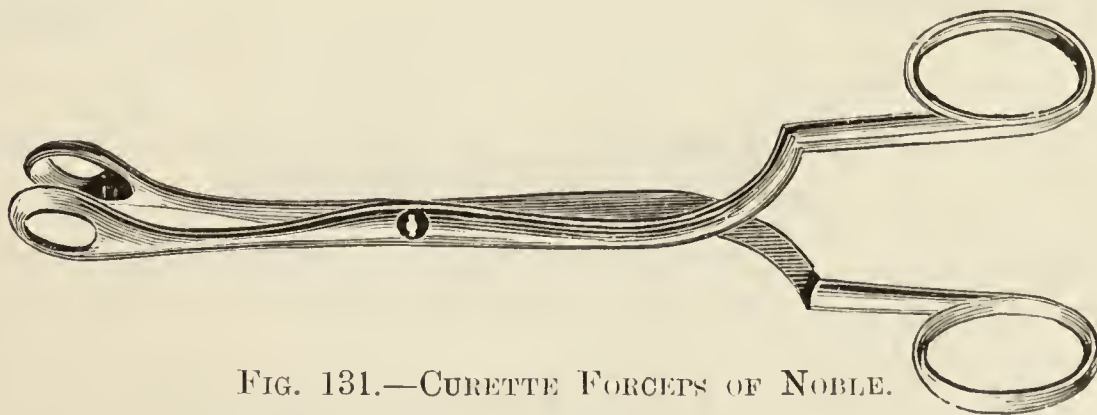


FIG. 131.—CURETTE FORCEPS OF NOBLE.

of the tissues on the spot we are operating upon. With a fine long pipette the uterine cavity is washed out from time to time, and when the curettage is completed it is mopped out, with strips of sterilized gauze, carried well in on slender forceps, as shown in Figs. 132, 133. It is now dried out with iodoform gauze, and, if it be

indicated, the uterine probe with cotton-wool tightly rolled on it is dipped in chromic acid solution (grs. xxx.—3 i. to the ounce), and is carried into the uterine cavity, and the application of the acid is made. The vagina and cervix are now dried, and finally a strip of sterilized iodoform gauze is carried into the uterine canal, and the vaginal end tied with silk, which is distinguished by one knot

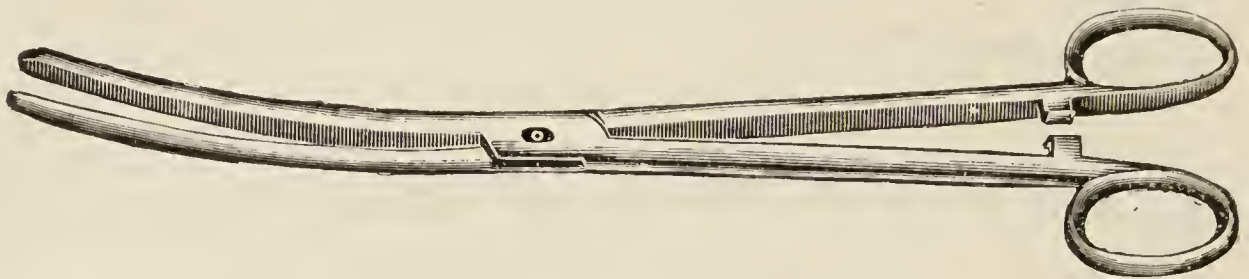


FIG. 132.—SLENDER CLAMP FORCEPS FOR CARRYING GAUZE INTO THE UTERINE CAVITY.

being made. A larger strip of moist iodoform gauze is tied in the middle. Either end is carried up at each side of the vagina so as to include the cervix and cover it; this piece of silk thread is tied with a double knot, and finally some sterilized gauze from a roller is carried into the vagina, care being taken to keep the strings securing the iodoform free from and outside the gauze. These tampons are not disturbed for forty-eight hours. It is well to give a bromide of potassium mixture at intervals for the first twenty-four hours, and to place a trional suppository in the rectum the night of

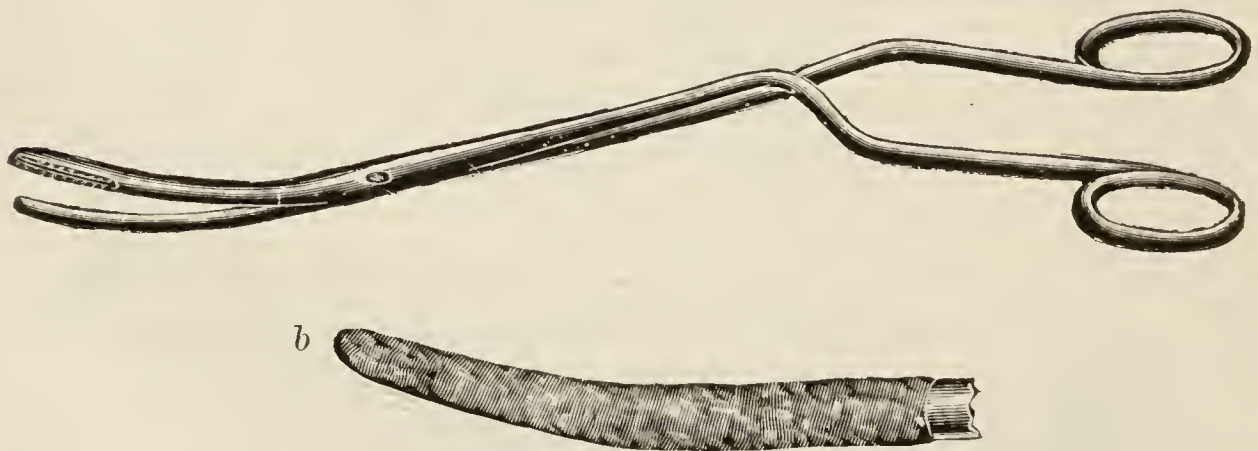


FIG. 133.—SLENDER INTER-UTERINE FORCEPS FOR WIPING OUT THE UTERINE CAVITY WITH GAUZE OR COTTON WOOL; *b*, END OF SAME WHEN COVERED WITH COTTON WOOL.

This latter is firmly secured by enclosing a portion of the wool between the blades, and then wrapping it round.

the operation. It is my practice, after forty-eight hours, to tampon the vagina loosely for the first week with moistened chinosol or sterilized iodoform gauze. After this it is well to use a daily antiseptic douche for another week.

It is now clearly established that the endometrium, after an aseptic curettage, is reproduced in its entirety within a period of from eight to ten weeks. The contrast between the normal appearance of the mucosa after the curette, and after the employment of caustics, is marked. In the latter case, there is an atrophic condition, with absence of the glands and excess of the connective tissue.

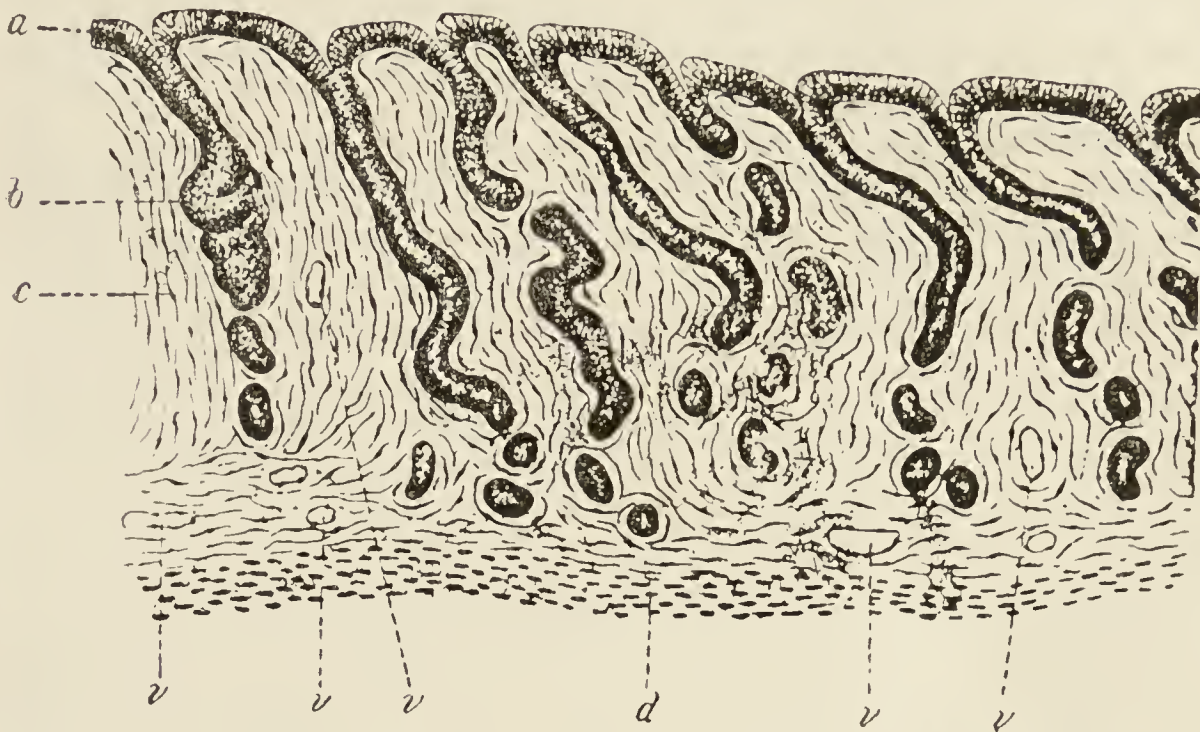


FIG. 134.—VERTICAL SECTION OF THE UTERUS THREE MONTHS AFTER CURETTAGE. (BALDY.)

a, epithelium; *b*, new-formed glands; *c*, connective tissue; *d*, muscular tissue; *vv*, blood-vessels.

Dangers of Dilatation and Curettage.—The point must be emphasized that curettage, especially in chronic cases of uterine affection, is not without its risks. This remark applies particularly to the operation when it is carried out with the aid of dilatation in women in whom there may be reason to suspect past trouble of the adnexa. Dormant states of the ovary and tube may be roused into acute disturbance, and suppurative mischief in the adnexa may be started. This may occur even though every conceivable care and precaution has been taken in carrying out the operation.

Case of Pelvic Abscess following Curettage.—A lady, aged forty-two, had previously had the uterus dilated and explored. I again dilated the uterus, and the unhealthy portion was curetted. Carbolic acid was applied to the cavity. She had had most profuse hæmorrhage for some months from a large subinvolved uterus. There was some attendant endometritis. On the third day she had a severe attack of uterine colic. This was followed by a long and anxious time, during which an abscess formed in the left broad ligament, which was opened from the abdomen and drained. The patient

finally made an excellent recovery, and from the date of the operation to the present time there has been no bleeding. This is the only instance in which any complication has followed the operation in my hands.

Christopher Martin, in a paper entitled 'When and how to curette the Uterus,' confirms the caution I have given in the text with regard to salpingitis, and also curettage for bleeding myoma.

'I have seen,' he says, referring to curettage when there is old or recent septic or gonorrhœal inflammation of the adnexa, 'a slumbering salpingitis converted into a virulent and fatal pyo-salpinx by such a proceeding.' Again, his criticism on temporizing with offensive discharges or hæmorrhage, due to the retention of the products of conception, cannot be too strongly emphasized, though in these cases special care has to be taken with regard to dilatation and antisepsis.

I cannot but agree with his comments on curettage as a palliative for hæmorrhage consequent upon simple myoma. I am convinced that 'useless scraping' of the endometrium, as is sometimes done in these cases, is attended with risks of sepsis, and is of no permanent benefit. In cases where it may be thought necessary, oöphorectomy is a far preferable procedure. As to cancer, he makes the practical comment that, 'at best, the respite is short, and in many cases when the disease again manifests itself it advances with fearful rapidity. When the growth is strictly limited to the cervix or the endometrium, we should offer the patient the more certain hope of cure afforded by vaginal extirpation of the uterus. If the disease be too far advanced for this operation, the less we interfere with it the better.'

On the other hand, it is only right to say that I have had some excellent results in cases of myoma in temporarily arresting hæmorrhage, where the patient would submit to no operation other than curettage, and in which the use of the curette was followed by an application of chromic acid.

Orloff also advocates the operation in such cases, as allowing time for recuperation in small fibroids which do not cause pain, and in those instances where the menopause is approaching.

In two important communications made to the Obstetric and Gynæcological Society of Paris, June, 1895, by Bonnet and Fournel, and quoted by Edge in the *British Gynæcological Journal*, February, 1895, p. 384, the relative indications and contra-indications, advantages and disadvantages, and the dangers of dilatation of the uterus and drainage, are clearly set out.

The conclusions of Fournel show a very strong bias against dilatation in peri-uterine lesions. He argues that the normal uterus, if tamponed, gives forth a discharge; that dilatation cannot possibly touch many of the diseased states of the adnexa; he disagrees with Doléris as regards the success and efficiency of the treatment. While allowing for its indication in non-suppurative conditions suitable for expectant treatment, he

condemns it in suppurating lesions, and emphasizes the caution that dilatation causes indirect mischief to the general health as well as to the pelvic organs. He asserts that the fatal results of such radical operations as oöphorectomy and hysterectomy have their mortality increased by previous dilatation. Bonnet, on the other hand, agrees with Walton, Poulet, Doléris, Labadie-Lagrave, and others, on the efficacy of dilatation, curettage and drainage in salpingitis, and in affections of the adnexa complicating displacements of the uterus. He says: 'I have never seen a fatal result, nor any aggravations of the lesions of the appendages, when the treatment has been carried out properly and gradually.' In recent cases of cellulitis, and in cystic conditions of the endometrium, he advocates dilatation.

The truth regarding dilatation and curettage may be placed as midway between the views of its advocates and opponents. In such capable hands as those of Olshausen, death has followed from dilatation; and that, even with the greatest care and complete antiseptic precautions, alarming symptoms may arise consequent upon its employment, has been proved to myself. This I have shown in a case in which pelvic abscess followed. True, I have never had in my own practice a fatal issue, and, with the exception quoted, never any unpleasant consequence; but I have thus emphasized the unfavourable possibilities of the procedure, in order to draw attention to the unavoidable risks that are occasionally associated with it, especially if it be carried out without stringent aseptic precautions. This risk may be largely increased should it be performed in ignorance of the fact that there is an ectopic gestation present.

CHAPTER VI.

SOME REMARKS ON SUTURES AND LIGATURES.

Catgut Suture.—For most gynæcological operations I use catgut for all buried sutures, and celloidinzwirn for the skin. There is a divergence of opinion amongst operators as to the superiority of silk or catgut. Equally eminent and distinguished surgeons use both materials in their technique. In suturing the intestine, the stomach, or the omentum, silk is preferable, but for all other purposes in gynæcology I prefer cumol gut, chromocized cumol gut, or that prepared by Martin's method, as has been already described. The latter ties easily and rapidly, does not slip, nor cause stitch abscesses, and resists absorption for a sufficient length of time to prevent any fear of hæmorrhage.

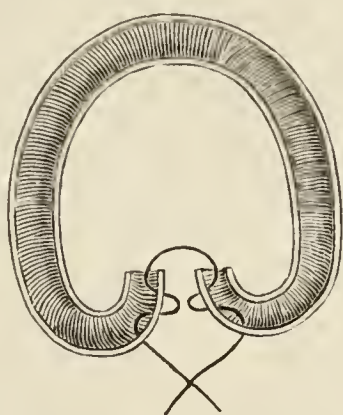


FIG. 135.—CZERNY'S
SUTURE.

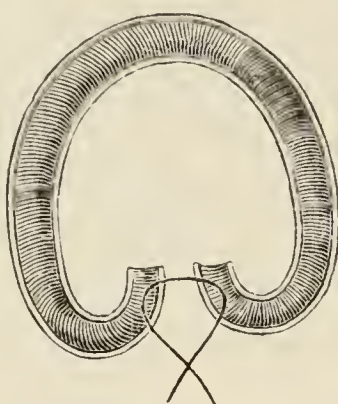


FIG. 136.—LEMBERT'S
SUTURE.

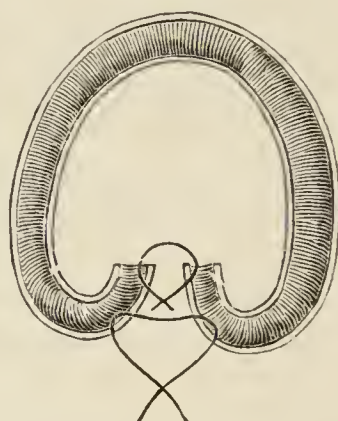


FIG. 137.—GUSSEN-
BAUR'S SUTURE.

Of kangaroo tendon, introduced by Marci of Boston, I have no personal experience. It is stronger and more slowly absorbed than catgut. Bronze aluminium wire as used by Bumm also makes an admirable skin suture, while silver wire is to be preferred as a buried suture in hernia, and for deep lacerations of the cervix, as well as in the closure of some fistulæ. Silkworm gut is preferred by some operators as a buried suture, and also for the skin. Horsehair is not used much now. For plastic operations, celloidinzwirn, silk, and silver wire are the best materials.

With regard to special sutures, a brief reference to the most important employed by the gynæcologist must be useful to the surgeon. The subjoined

figures and those which follow them are taken from the valuable work of Pozzi.*

Figs. 135–137 represent the three well-known methods of Czerny, Lembert, and Gussenbaur of suturing the intestine.

The Suture ‘à Points Séparés.’

The principle of this form of suture is to secure complete coaptation of the sides of the wound by passing three threads at different distances from its margin, from one side to the other of it. The first of these, the farthest from the edge, is passed deeply and completely beneath the exposed surface, and is brought out at a corresponding point on the other side. The second is not carried altogether underneath, but appears crossing a portion of the wound; while the third, or most superficial, simply binds together its divided margins. The deepest sutures (those first passed) are tied last.

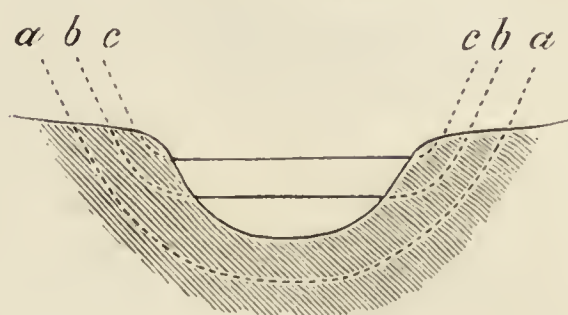


FIG. 138.—POSITION OF THE THREE THREADS IN THE SUTURE ‘À POINTS SÉPARÉS.’

Simple Continuous Suture.

This is made by securing one end of the gut or silk with three knots at an angle of the wound. This terminal point of the gut or silk is held in a forceps

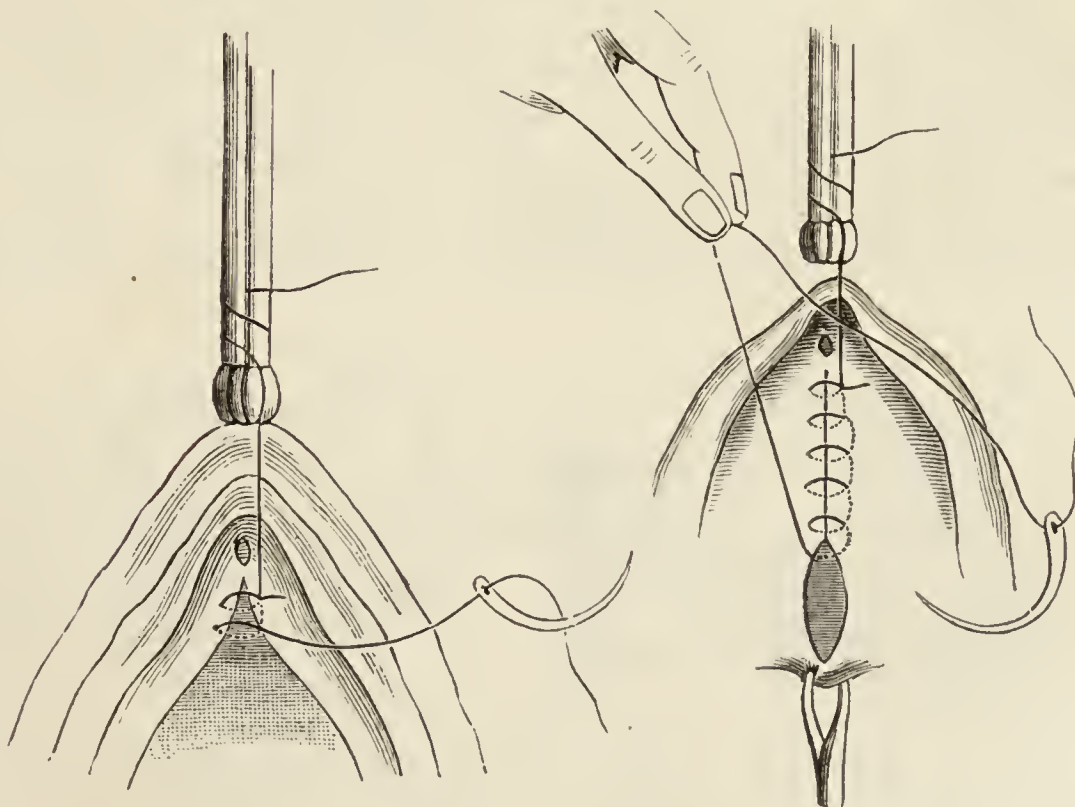


FIG. 139.—SIMPLE CONTINUOUS SUTURE COMMENCED. Forceps holding the detached stitch at the angle of the wound.

FIG. 140.—CONTINUOUS SUTURE NEARLY FINISHED.

* ‘Traité de Gynécologie.’

by an assistant; the gut is now carried in continuous loops at a distance of two millimetres from the margin of the wound until it arrives at its other end, being drawn fairly tight. A little care is required that the consecutive stitches are adjusted with equal tightness.

Suture à Étages.

When the simple continuous suture is obviously insufficient from the size or depth of the wound to close it, this variation is suggested. When it has reached the widest portion of the wound, the thread is carried, not through the margin, but at some distance through the deeper tissues in the same continuous fashion, thus diminishing its width for the extent desired by the operator. The needle is then again carried through the superficial structures, the wound being finally closed by a further continuation of the original suture. In some instances it may be necessary to insert two or three of these superimposed threads in the centre of the wound, in order to sufficiently contract the deeper tissues. Care must be taken not to draw the sutures too tightly, and thus to approximate too closely the separate stitches.

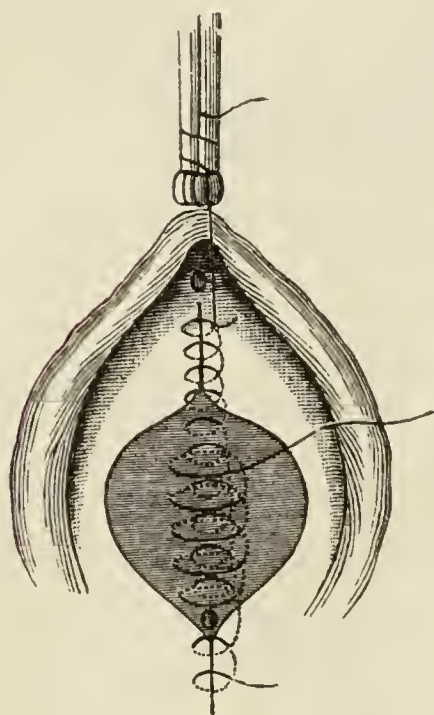


FIG. 141. — 'SUTURE À ÉTAGES.' Three overlying sutures in the middle of the wound.

In passing the sutures, should the thread be either cut or broken, another is inserted at the same level, knotted, and the stitches are continued. Where the tension is great, the insertion of a few separate superficial stitches of silver wire or catgut is useful.

The Quill Suture.—Pozzi prefers small rolls of iodoform gauze as quills in

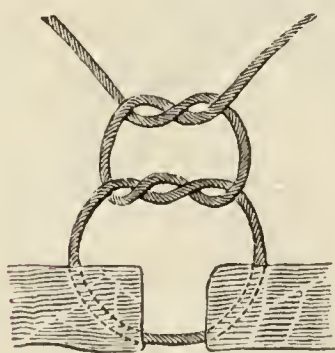
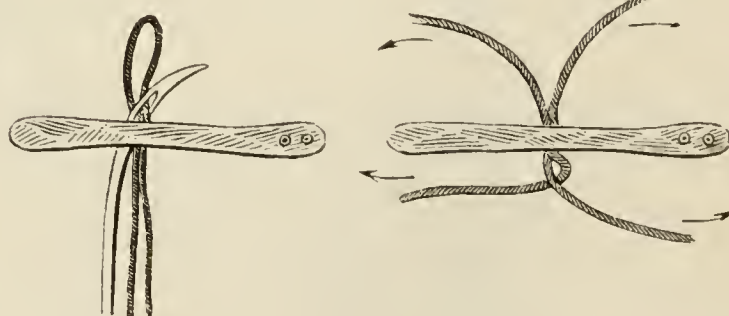


FIG. 142.—SURGEON'S KNOT.



FIGS. 143, 144.—ORDINARY LOOP-KNOT FOR PEDICLE. (DORAN.)

Fig. 143, Passing of loop before withdrawing needle; Fig. 144, Crossing of threads.

the use of the quill suture, and in certain cases he uses long and deep sutures, which are retained by rolls of iodoform gauze folded over the abdominal wall.

For **ligatures**, whether in tying *en masse* or separately, catgut is the preferable material for intra-peritoneal purposes. And for such, it has in the hands of the majority of surgeons, almost entirely superseded silk.

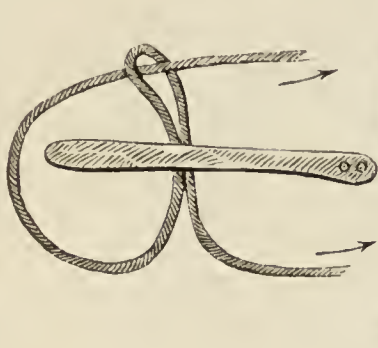


FIG. 145.—BANTOCK'S KNOT.

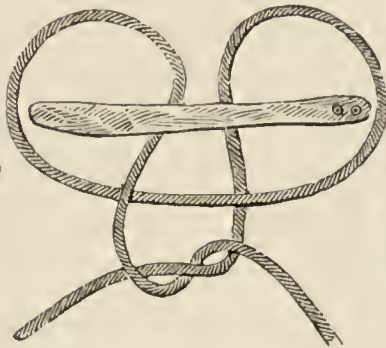


FIG. 146. — TAIT'S 'STAFFORDSHIRE' KNOT.

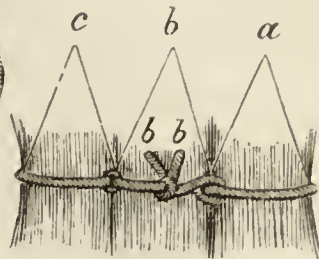


FIG. 147.—CHAIN LIGATURE ON PEDICLE, THREADS CROSSED. (DORAN.)

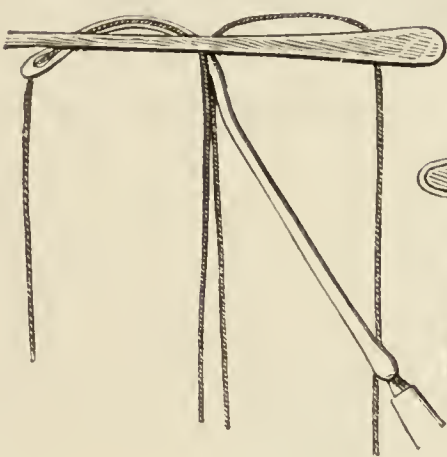
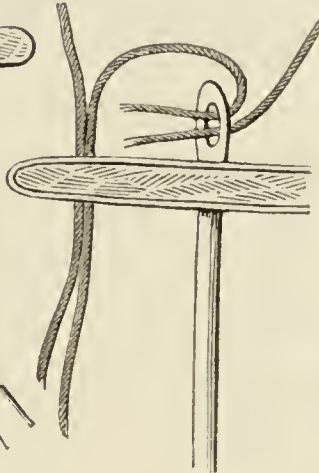


FIG. 148.—CHAIN LIGATURE BEING APPLIED ON A MEMBRANOUS PEDICLE.



FIGS. 149 AND 150 SHOW THE METHOD OF MAKING CONSECUTIVE LOOPS OF THE CHAIN LIGATURE.

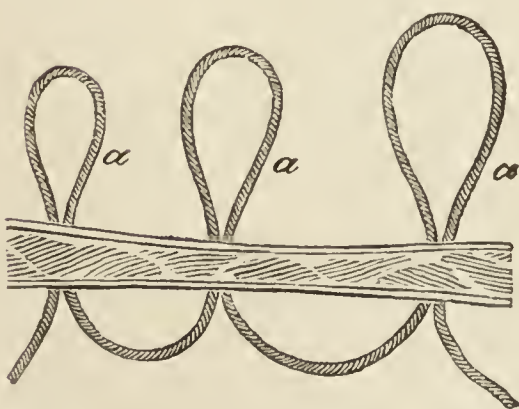
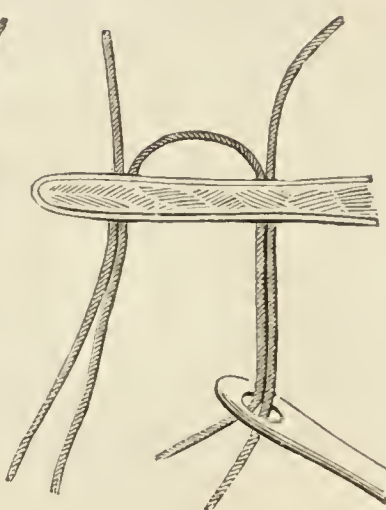


FIG. 151.—LOOPS OF CHAIN LIGATURES.

a, a, a mark the points where these are cut for knotting.

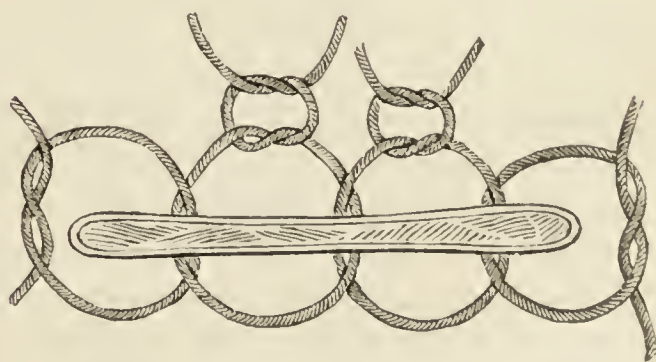


FIG. 152.—SHOWING THE THREADS CROSSED, KNOTTED, AND READY FOR TIGHTENING.

Fig. 142 represents the surgeon's knot made; Fig. 143, the method of tying the pedicle by piercing it with a double thread, which is then cut, and

both ends knotted, as shown in Fig. 144; or the thread is passed through the loop, as is done by Bantock (Fig. 145); or the 'Staffordshire knot' (Fig. 146) of Lawson Tait is adopted. In this latter the pedicle is transfixed with a blunt-pointed or aneurism needle armed with a double thread. The needle is not withdrawn. Through the loop thus formed are brought the ends of a ligature carried loosely round the pedicle. The needle is now withdrawn, by which means the ends of the pedicle ligature are brought back through the pedicle and lie above their own loop. One of these ends is passed under the loop, and both are tied firmly. They are again carried round the pedicle, and once more firmly tied.

Chain Ligature.—This form of ligature is useful in flattened pedicles, and in tying membranous adhesions. Figs. 145–152 show sufficiently the method of tying these.

Mattress Suture.

Another admirable form of buried suture is the mattress suture. It is made with silver wire. Its typical use is in closing the muscular tissues and fascia in the operation for hernia. Two needles are threaded with the wire. One is darned once through the tissues at one side of the wound, and is then brought out and passed through the structures at the opposite side; the other needle is passed in a similar manner, and a loop is thus left at either side. Similar loops to the number required are then passed. The free ends of the wire are next pulled together, twisted, and cut off close.

The following case well illustrates the advantage of this suture:—

Large Hernia following on Repeated Cœliotomy Operations.*

This was the largest post-operative hernia I have ever seen. The drawing (taken from a photograph) gives only a partial idea of its extent. When I saw the patient the bowel was down in a large sac which protruded over the pubes, where there was a more defined pouch, covered only by the integument (Fig. 153). A large space of several inches separated the recti muscles and fascia. The bowel appeared to be adherent in parts to the parietal covering. She was subject to recurrent attacks of severe pain, and had to be confined to bed for several weeks before operation. This was due to attacks of subacute peritonitis. The old cicatrix extended from a short distance below the umbilicus to about two inches above the pubes. Cœliotomy had been twice performed. I did not learn until the day of the operation that the abdominal wound had been closed after the last operation without sutures, the parts having been brought together by adhesive plaster. The steps of the operation may be understood by the accompanying diagram (Fig. 154). Having carefully incised the skin (*c c*) in the middle line over the cicatrix by a cautious dissection vertical to the bowel, which was

* *Lancet*, October 18, 1901.



FIG. 153.—POST-OPERATIVE, ABDOMINAL HERNIA.* (FROM PHOTOGRAPH.)
Before operation.

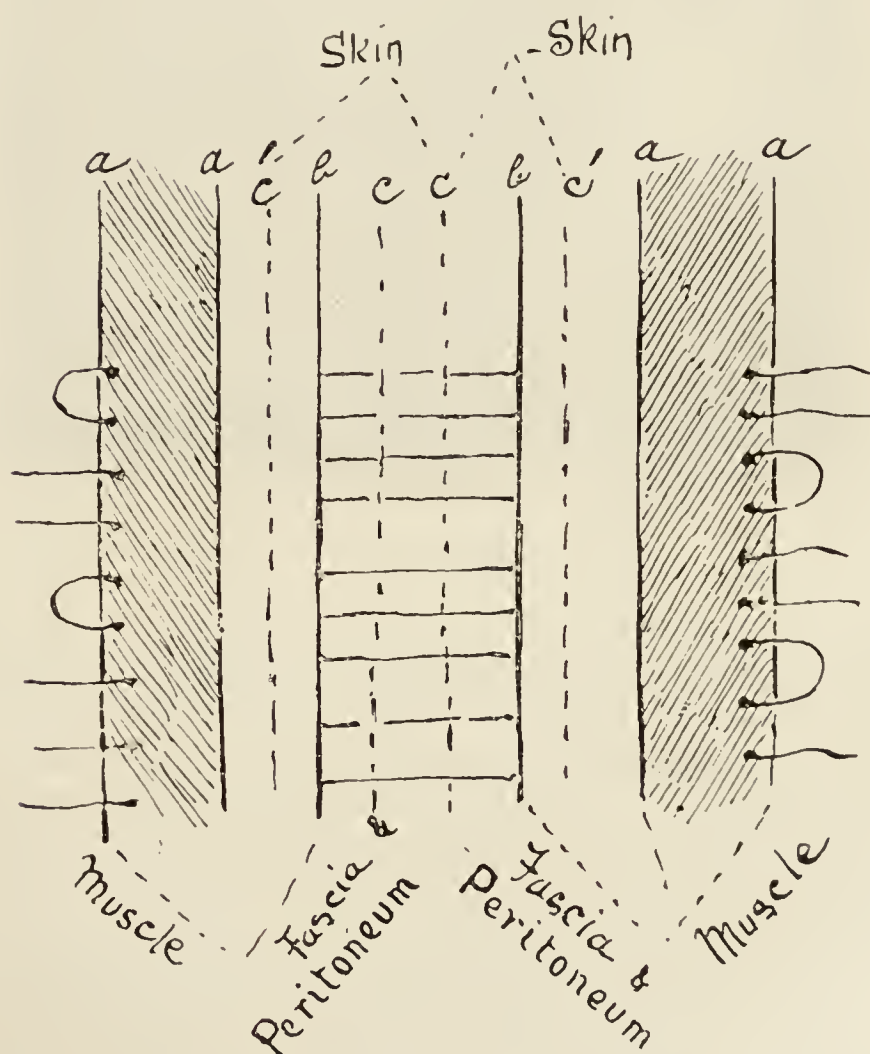


FIG. 154.—METHOD OF CLOSING THE ABDOMINAL WOUND.

* The drawing does not sufficiently represent the large protrusion of the bowel that was present.

immediately subjacent to it and adherent, it was reflected back to the extent of three inches at either side (*c'*). Some dense fascia (*b*) was exposed which was continuous with the peritoneum and the fascia of the rectus (*a a*). This fascia also was raised and reflected back, the dissection including a portion of the rectus sheaths (*a a*). All bleeding points from adhesions of the bowel were secured. The whole omentum and bowel were then covered with a sterilized napkin wrung out of warm formalin solution. Mattress sutures were then carried from side to side in the following manner. Two straight ovariectomy needles, each threaded with fairly strong silver wire, were passed parallel from the outer border of the rectus including the fascia, across, and passing under the dissected fascia were brought out at corresponding points on the opposite side. Six of these sutures were carried

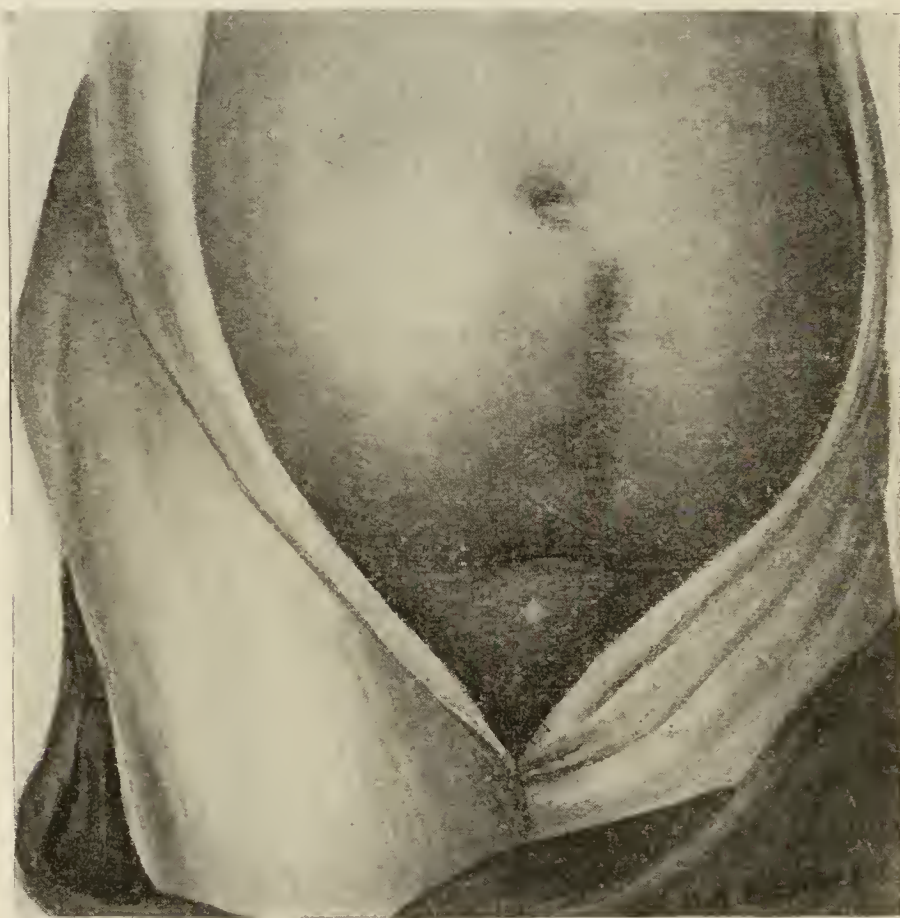


FIG. 155.—AFTER OPERATION. (FROM PHOTOGRAPH.)

alternately in the manner shown in the drawing, and a single strong wire was passed at the upper and lower angles of the wound. The central ones were separated, and the napkin was caught in the centre and readily withdrawn between the sutures. These were then tightened, and the ends, twisted and cut close, were buried in the rectus muscle at either side. This brought a line of rectal fascia into apposition with the muscle and the underlying peritoneum, leaving a raised flap of fascia which projected at either side for the entire length of the incision. This was pared and made to overlap, and then closed with silkworm-gut sutures, which were cut short. The skin margins were then united. There has been no trouble whatever since the operation. She continues perfectly well, and has had no trouble up to the present time.*

* In another case, there had been a large congenital inguinal hernia the

Bumm (Halle) lays special stress in these cases of large hernia on securing free mobility of the fascial margins by complete separation of the rectus sheath from the muscle, and division of the outer margin of the latter so as to relieve the tension in bringing the fascial edges together. Also, he emphasizes the importance of *flexion of the trunk while suturing*. He employs bronze aluminium wire for the skin, thus avoiding any interference of the wound for three weeks.

Zweifel Suture.

A very admirable and readily made suture is that used by Zweifel, and known as the Zweifel suture. It is made with two needles, one handled and curved, the other short and blunt with one end split to hold the suture (Fig. 156). There are two principal forms of suture. One, a simple con-

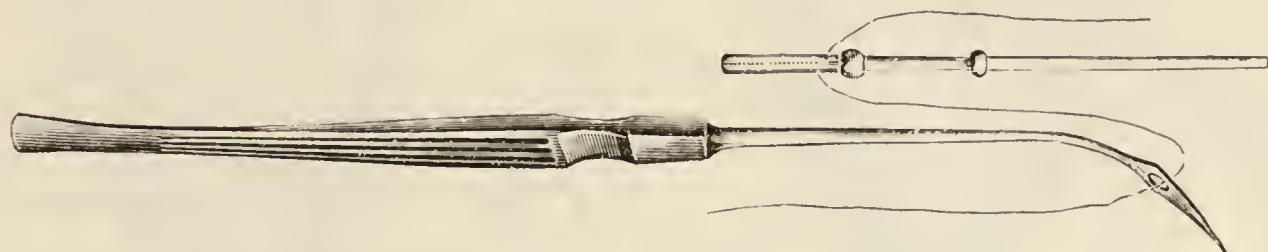
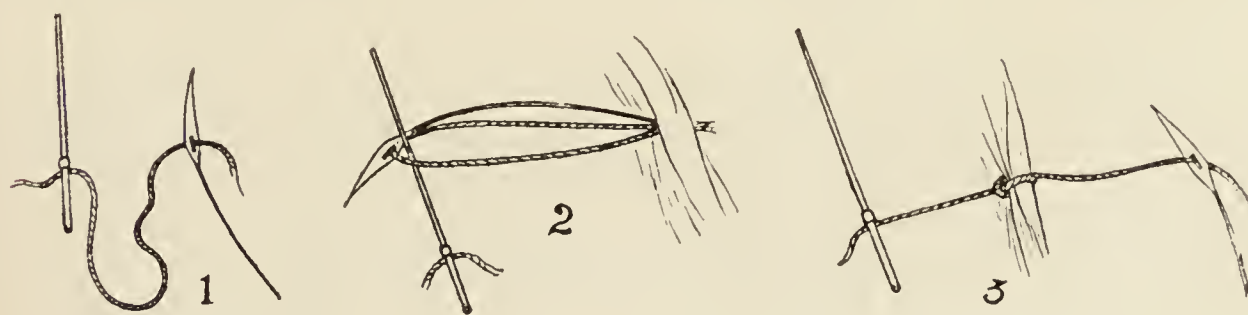


FIG. 156.—ZWEIFEL NEEDLES.

tinuous suture, is made as follows: The silk or gut having been fixed in the straight blunt needle, and the curved one threaded from its concave side, the end of the silk with the handle of the needle is secured by the hand.

The concave needle is carried through the two layers of peritoneum (Nos. 1 and 2), and the straight short needle in the left hand on the other



side is passed through the loop that is formed (No. 2). The needle is then withdrawn while the threads are pulled on equally (No. 3). In this way the two surfaces of the peritoneum are joined, and so proceeding up the wound a lateral continuous suture is rapidly made (Nos. 4 and 5). In the second kind of suture, the first three steps are the same as in that just described, but after the curved needle has been brought back, and before it pierces the tissue again, the short needle is carried under the thread at that side, and brought to the other side (Nos. 7, 8, 9), and again the steps are the same as in the first instance. The method is continued, giving a series of locked

abdominal wall had given for over seven inches above the external ring (some years have elapsed since I operated), burying the silver mattress sutures, and the patient is perfectly well.

stitches (Nos. 10 and 11), much on the principle of those made with a sewing-machine. A space of a centimetre and a half is left between the stitches. Zweifel uses this latter suture for the skin. He does not use it for the fascia, which he closes with an interrupted suture.

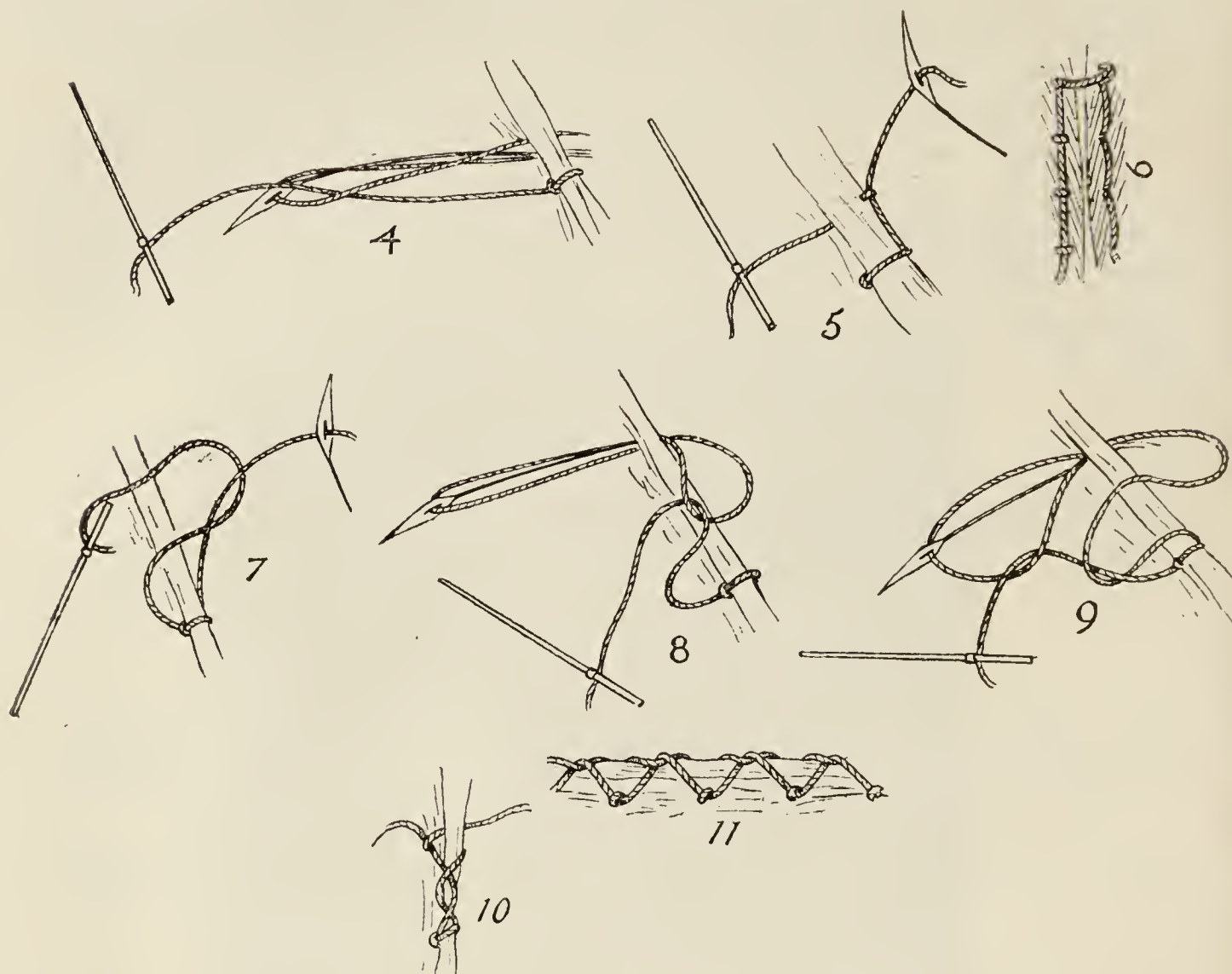
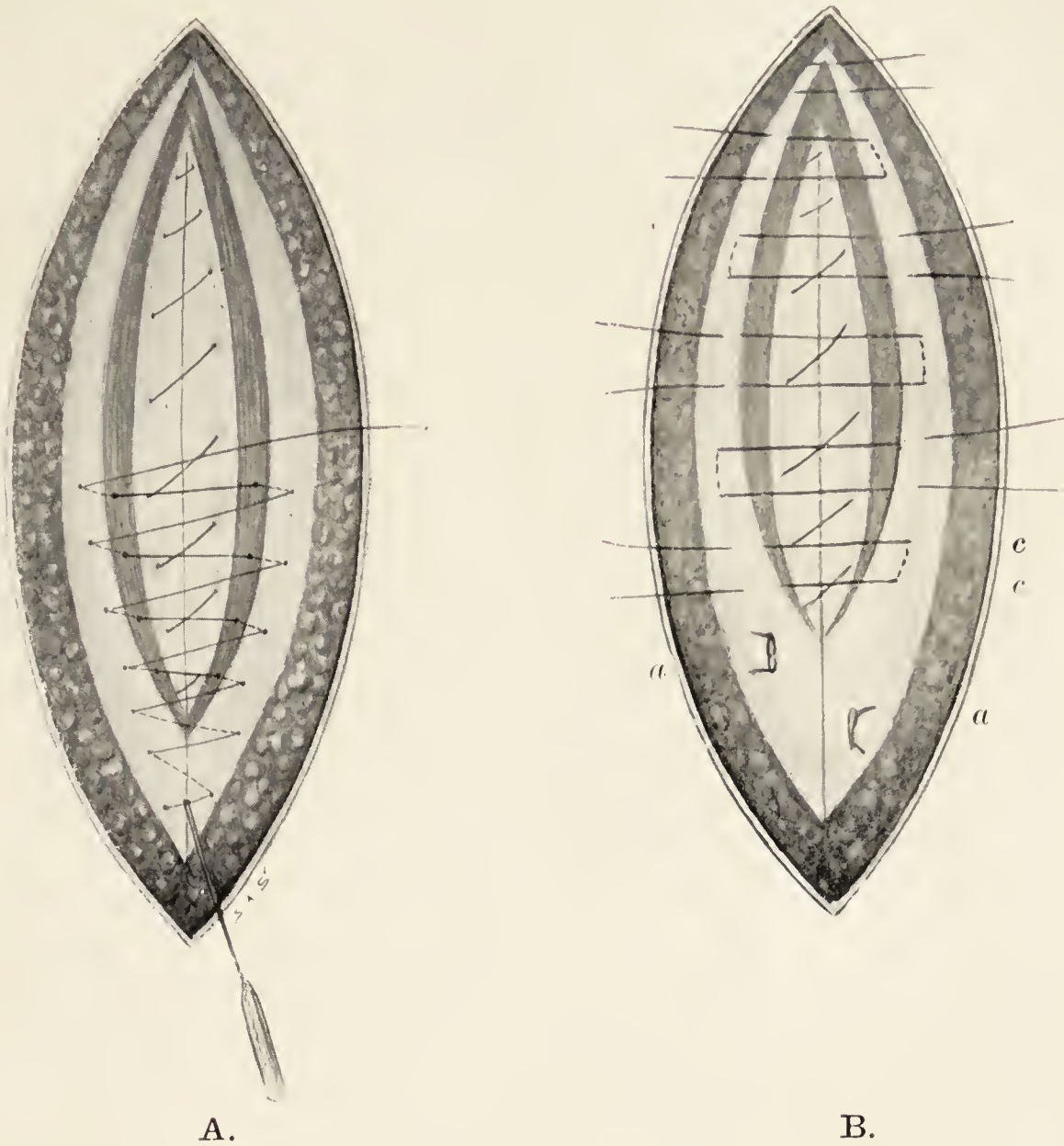


PLATE XI.



A.

B.

A. SHOWING THE CLOSURE OF THE ABDOMINAL WOUND. (AUTHOR.)

The peritoneum is united by a continuous suture of eumol gut. The aponeurosis is freed from the rectus muscle at either side. The needle is then made to traverse the fascia, take up a loop of muscle at either side with the fascia (shown in the dotted lines), which is then perfectly adjusted, its edges in perfect apposition. The skin is then closed with celloidinzwirn or bronze aluminium wire.

B. CLOSURE OF THE FASCIA BY MATTRESS SUTURE, AFTER C. NOBLE'S METHOD.

a, a, two first sutures tied. Two straight needles are threaded with a single thread—one is carried through the fascia *from beneath* at *c*, and the thread is then carried over and made to pierce the fascia underneath at the opposite side; the other needle pursues the same course, the loops being placed alternately.

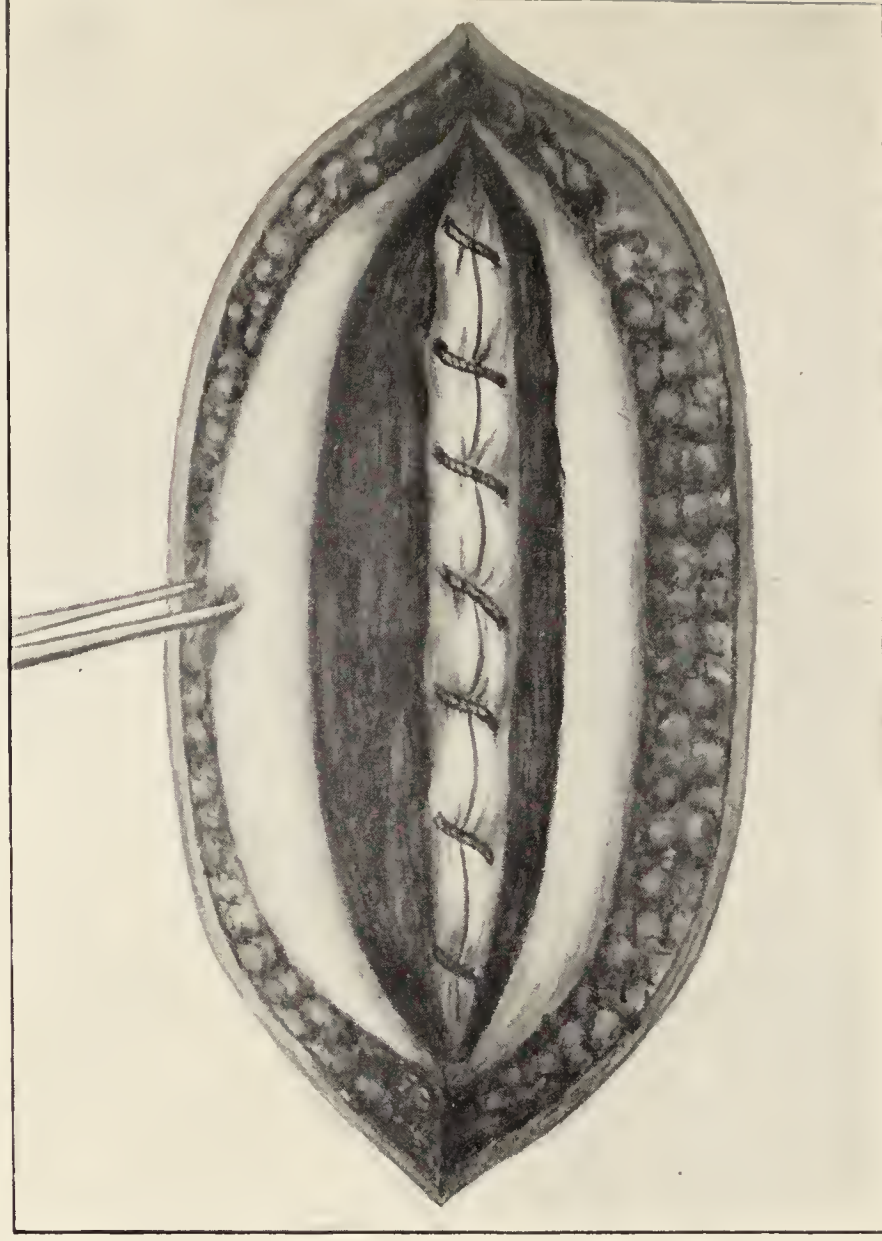
[To face p. 170.]

PLATE XII.



SHOWING THE WOUND IN THE RECTUS CLOSED WITH CONTINUOUS CATGUT SUTURE; CLOSURE OF THE APONEUROSIS BY SUPERIMPOSING THE RIGHT APONEUROSIS UPON THE LEFT AND SUTURING IT WITH SPECIAL FORM OF CONTINUOUS CATGUT SUTURE. (NOBLE.)

It will be seen that Noble closes the muscle by a separate suture.



SHOWING CLOSURE OF PERITONEUM WITH CONTINUOUS CATGUT SUTURE; THE BORDERS OF THE (DIVIDED) RECTUS MUSCLE; THE LEFT APONEUROSIS FREED FROM THE LAYER OF FAT; THE RIGHT APONEUROSIS SEPARATED FROM THE RECTUS MUSCLE AND REFLECTED. (NOBLE.)

In a more recent method he uses the mattress suture for the fascia.

[To face p. 171.]

CHAPTER VII.

DISORDERS OF MENSTRUATION.

Amenorrhœa and Leucorrhœa.

Amenorrhœa : 1. Primary, frequently persistent (*emansio mensium*).
2. Secondary, usually temporary (*suppressio mensium*).

Dysmenorrhœa :—

Ovarian, due to	-	{	Congenital abnormalities
			Congestion and obstructive congestion
			Ovaritis
			Apoplexy
			Changes in corpora lutea
			Cystic degeneration
			Cortical and interstitial sclerosis
			Gonorrhœa
			Cirrhosis
			Sclerosis
Tubal, due to	-	{	Adhesions.
			Congenital abnormalities
			Inflammation
			Adhesions
			Displacement
			Strangulation
Uterine, due to	-	{	Cystic disease.
			Congenital malformations
			Version and flexion of the uterus
			Stenosis of the cervical canal
			Interstitial fibroids
			Polypi
			Traumatic causes (results of operations)
		{	Endometritis.

Atresic -	{	Atresia of Fallopian tube
		„ uterine canal
		„ vagina
		„ vulvar orifice.

Membranous - A special form of uterine dysmenorrhœa.

Menorrhagia : 1. Catamenial excess (either simple excess in the normal physiological and pathological process, or the result of a morbid condition of the ovaries, uterus, or other organ, as the heart or liver).

2. Climacteric ; occurring at the menopause.

Metrorrhagia : Abnormal flow of blood during the intervals between the menstrual acts.

3. Vicarious (diverted)—pneumonic (hæmoptysis) ; nasal (epistaxis) ; gastric (hæmatemesis) ; cutaneous (ecchymosis) ; renal (hæmaturia) ; cerebral and retinal ; rectal.

Amenorrhœa.

Causation.—1. Removable causes (excluding pregnancy), many of those cited above as influencing ovulation and menstruation.

2. Irremovable causes—absence, or congenital malformation and arrest of development, of the ovaries, Fallopian tubes or uterus ; acquired disease of the ovaries or uterus.

We find that the commonly occurring causes associated with a diminution or temporary absence of the menstrual flow are :—

(a) Anæmia and chlorosis ;

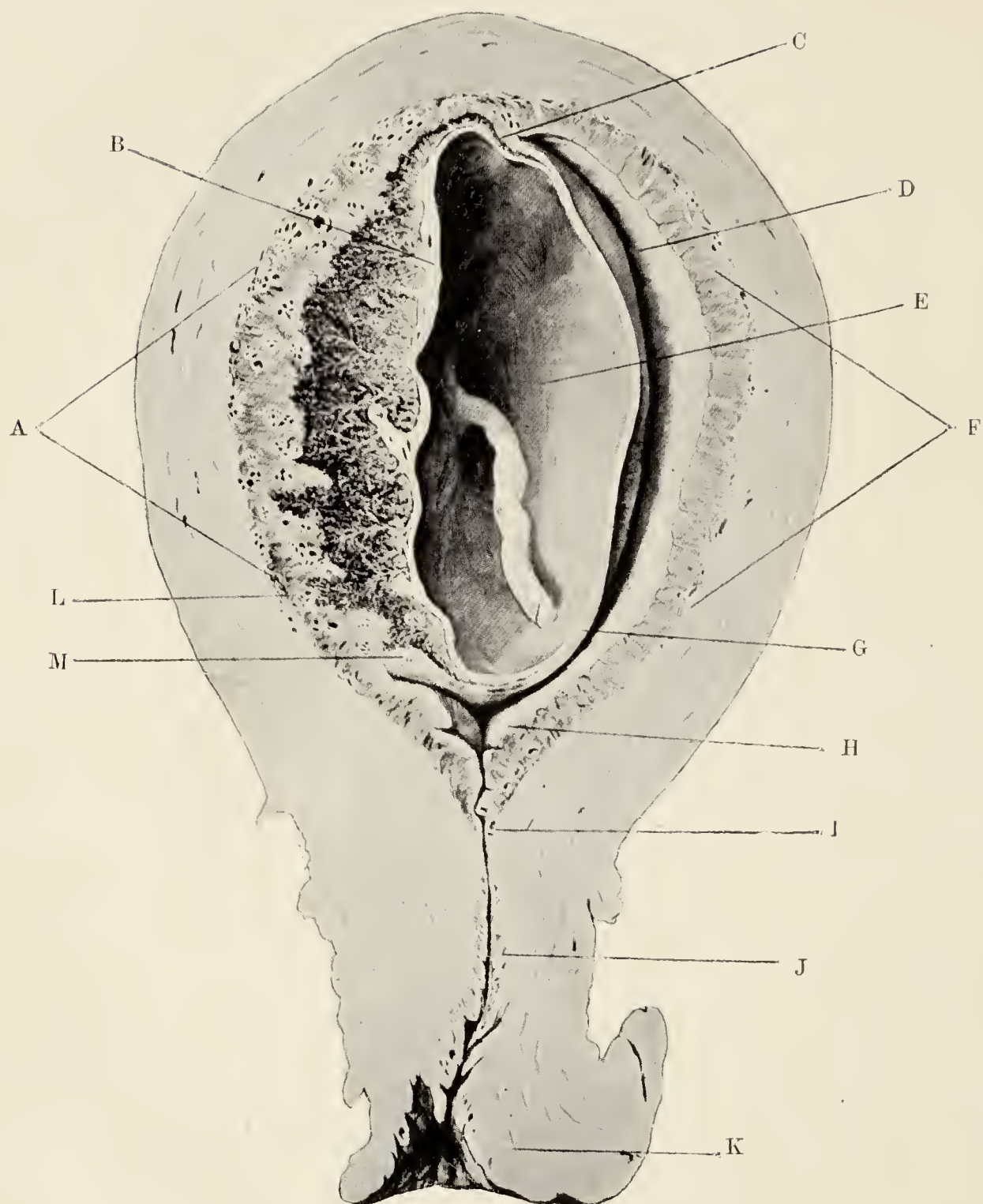
(b) Plethora ;

(c) Some accidental influence operating on the woman, as mental shock, fright, cold, sea-bathing (all these repressing causes have a more decided effect if they occur at or about the time of a menstrual epoch) ; acute and chronic wasting diseases ; the exanthemata ;

(d) Congenital.

Differential Diagnosis and Pregnancy.—As it is the rule, though there are occasional exceptions, that the menstrual flow ceases during pregnancy, it is always our duty, in any suspicious case, most carefully to exclude any chance of this condition being the source of the trouble. The student of midwifery has already studied all the signs and symptoms of the pregnant state. He is aware how difficult it is, before the uterus rises above the pubes, to speak with any degree of confidence of the existence of pregnancy.

PLATE XIII.



UTERUS GRAVID. THIRD MONTH. (BUMM.)

A, decidua serotinae; B, chorionic membrane; C, starting-point of the decidua reflexa; D, uterine cavity; E, cavity of the ovum; F, decidua vera; G, decidua reflexa and chorion; H, lower part of uterine cavity; I, cervical canal; J, internal os; K, external os; L, enlarged serotinal arteries; M, starting-point of decidua reflexa.

[To face p. 173.]

* * * The author is enabled to insert this photograph through the courtesy of Professor Bumm, who sent him the original copy.

On no question must we guard our expressions or our suspicions more than on this, and, if we have a doubt, be careful not to use the sound in diagnosis.

A lady consulted me to ascertain whether she was pregnant or not, as she was desirous of taking a long holiday trip, and would not venture if she were. There had been a gap of one month, and then two slight periods. She volunteered the information that she had consulted a doctor, and he told her, *after examination with the uterine sound*, that he believed she was not *enceinte*. She also told me that she had domestic reasons for not wishing to have a child. The means used in diagnosis should at least have solved for her this little difficulty.

Both in those cases in which the possibility of conception is for any purpose concealed or denied, and in those in which the desire of the woman is parent to the belief, and she assumes that she is or is not pregnant, is this caution necessary. It requires considerable tact to avoid committing one's self to an opinion until such a period of pregnancy has arrived when we are able to speak with confidence.

I do not enter fully into the differential diagnosis of pregnancy; this is exhaustively done in every treatise on midwifery. This table of the most important proof, divided over three periods, may be of service :—

FIRST PERIOD.

Cessation of the menses; reflex and sympathetic disturbances; changes in the breasts; morning sickness; enlargement of the uterus and altered position, with commencing change in the os uteri and cervix; vaginal signs in alteration of colour and increase of natural secretion.

SECOND PERIOD.

Progressive increase in the size of the uterus, which continues until the close of pregnancy, with characteristic alterations in the abdomen; further changes in the breasts (areolæ—secretion); foetal projections and heart-sounds; ballottement; placental souffle.

THIRD PERIOD.

Uterine contractions well felt; more characteristic changes in the os uteri and cervix; all the signs of pregnancy becoming more manifest.

Hegar's sign consists in the uterus losing its pear-shaped outline; 'the body is bellied out over the cervix in all the transverse diameters, especially antero-posteriorly.'

It may be accepted as a general rule, to which we have occasional exceptions, that we are correct in surmising that a married woman in fair health, who has ceased menstruating, and has an enlarged uterus and softened os and cervix, is pregnant. We should not be too ready to be influenced by her assertion that she has menstruated, or, rather, thinks she has, and thus be too quickly led into passing the sound. Women mistake other blood discharges for those of menstruation, and the existence of pregnancy is not

to be negatived because a woman has had even severe losses. I have known the pardonable error made more than once of the sound being passed for an assumed hyperplasia, and abortion follow. In both cases the woman ridiculed the idea of pregnancy.

Hegar's Sign.—Referring to Hegar's sign, the following observations of Charles Noble are of practical moment:—

‘Within six weeks after the beginning of pregnancy the ovum has grown sufficiently to cause the corpus and fundus of the womb to assume a distinctly spheroidal shape. As during this time the cervix has altered very little in its form, we have present, to make use of geometrical terms, a spheroidal body posed upon a cylinder. If one will picture this state of affairs, he will see that the sphere juts out from the cylinder prominently and in every direction. In other words, when examining the pregnant uterus between the sixth and twelfth weeks, the uterus will be found enlarged to correspond with the period of the pregnancy; the corpus and fundus will be found as a spheroidal body, and the corpus can be easily distinguished as jutting boldly out from the cervix in front, behind, and at each side. This sign is of the utmost value and absolutely reliable. The judicious practitioner, however, will not neglect to make use of corroborative signs and symptoms. The spheroidal body of the womb will be found softened, and as it is held between the two hands in bimanual examination, a feeling of semi-fluctuation can easily be made out. This softening and the semi-fluctuating should be found in all cases.’

In various abnormalities of the uterus, as hyperplasia, myoma, extra-uterine growths, and in adhesions of the pelvic viscera, this sign may be so masked as to be incapable of detection.

From the fifth to the sixth month, in the great majority of cases, we can speak with confidence of the uterine enlargement being due to pregnancy. Yet, remembering how often we meet with such pregnancy complications as fibroid tumours, ovarian cysts, ascites, flatulent distension, or hydramnios we had better keep always before us the fact that *the only absolute proof and infallible test of pregnancy is the auscultatory one of the fetal heart-sounds*. In all the others a man may be deceived. This must be so, or we should not have eminent gynæcologists committing the error of opening the abdomen for a tumour, ovarian or uterine, or performing the operation of paracentesis abdominis for ascitic accumulation, to find a pregnant uterus. Nor would there be the awkward mistake made in the opposite direction—woman, nurse, and practitioner awaiting the discovery of a phantom pregnancy and flatulent accumulation.

Anæmic and Chlorotic States are easily recognized in the pale conjunctiva, the colourless lip and gum, the white complexion; and in marked leukæmia, the wax-like look of the skin, the anæmic first sound and functional irregularities of the heart, the jugular pulse or bruit, the pale retina, the puffy state of the face and eyelids, and the accompanying group of neuralgic or hysterical symptoms constantly associated with these physical signs. Most marked of these

are headache, loss of appetite or capricious tastes in diet, lassitude, dislike for outdoor exercise, sleeplessness, neuralgic pains in different places, attacks of syncope, and a rather characteristic pain referred to the left side of the chest beneath the region of the heart. It is in such a general depraved state of the system that we are often consulted. The watery blood, with red corpuscles diminished in quantity and altered in their physical characters, does not respond to the demand of ovary and uterus; the vitality and nutrition of both organs are lowered. The act of ovulation gradually ceases, or may not occur at the proper time, or it is abortive and irregular, while the menstrual discharge is lessened, changed, or absent.

Plethora.—Just the reverse of this condition is met with in the *plethoric* and full-blooded. Here there is a hyperæmic condition of all the sexual organs. They participate in the general state of plethora of the entire system, and the other vital organs. The normal balance of blood-supply and nutritive growth and development is lost; congestion of both ovaries and uterus results. The act of ovulation is either prevented or arrested through this undue blood-supply; or it becomes at first irregular in time of occurrence, and in the quantity of the menstrual secretion, until, gradually interrupted, it finally ceases. This type of case is easily recognized. The ready flush, the high complexion, the throbbing vessels, the strong and full pulse, with accompanying symptoms of headache, functional heart palpitations, and proofs of congestion elsewhere in the lung, kidney, or retina, are a few of the signs that tell us of the cause of the amenorrhœa.

Accidental Influences.—We find these in injudicious habits of dress, diet, exercise; in some mental shock; in the sequelæ of various acute diseases which have lowered the vitality of the system, or interfered at the time of its occurrence with the menstrual function. If we go carefully into the history of any case when first we are consulted, we can generally place our finger on the fault which has, directly or indirectly, led up to the cessation of the menstrual flow, or its altered character. And in many cases that come before us it is to a depraved mental condition we must look for the primary source of the evil.

Congenital Defects.—When we are consulted by parents, or by the patient herself, for delayed menstruation, before making any internal examination it is well to enter carefully into the previous history. We can ascertain if there has been an indication at any time of an effort at ovulation, such as recurrent pains in the back

or sides, or an attempt at periodical discharge of any kind; if there be a general arrest in development in the direction of womanhood, both physical and mental; or if we can trace to any accidental cause the arrest or suppression of the flow. If not, we must keep before us the probability of congenital defects in ovaries, uterus, and vagina. If ordinary remedies fail to produce any effect, a careful digital examination in *the presence of the patient's friend or nurse* may be called for. By its help we may decide the question of congenital defect. Such an early examination is especially demanded in young married women, and in the unmarried, particularly if we have a history of old attacks of vaginitis, uterine displacements, pelvic peritonitis, or more urgent symptoms indicative of retained menstrual flow.

This would prevent not only the serious oversight of not recognizing the presence of morbid growths and diseased conditions of the adnexa, but such awkward mistakes as dosing with medicine for a considerable time, and sending to Continental ferruginous spas patients with congenital absence or malformations of the genital organs. Prolonged treatment for the consequences of atresic conditions of the uterus, vagina, and hymen, and the still more serious error of treating a young girl who has become pregnant for gastritis complicated by amenorrhœa are not such uncommon mistakes.

Absence of the Genitalia.

I have recorded *four cases of absence of the internal genitalia*. One occurred in the instance of a child, æt. 3. Here I was consulted for complete closure of the introitus, with the exception of an extremely small aperture which led to the urethra. The vaginal canal was found complete. In this case I resected the fold, closing the orifice, making a new vaginal outlet. The uterus was about the thickness of a quill, and a little over an inch in length, and there was complete absence of the adnexa. The second case was aged 22, and here the catamenia had never appeared. The vaginal orifice and the canal were normal, but there was no evidence of uterus save a small knob-like substance in the vaginal roof, and under the deepest anæsthesia no adnexa at either side could be detected. The mammary glands were quite rudimentary. I have recently seen two other cases in which the genitalia have been absent. The third was a child, æt. $8\frac{1}{2}$. (For particulars of this case, see p. 42.) The fourth, a patient, æt. 32, consulted me for severe pains in the head and periodical pain in the left side. She had complained of her head and some obscure abdominal pains from the age of 18 years. *There had never been any catamenial discharge*. There was considerable mental depression associated with her symptoms. Sexual instincts appeared to be perfect, and there had been a question of marriage. The mammary glands were fairly developed. The absence of catamenia, and some uncertainty as to the possibility of marriage, had of late distressed her, and her health had considerably deteriorated.

On examination under an anæsthetic, I found one small orifice, which proved to be the urethral. The clitoris and labia were perfect, but there was no introitus. On examination by the rectum, and bi-manually, I could find no uterus. I made an incision in the middle line to ascertain if I could light on any vaginal canal, and found that there was none, a musculo-cellular bed existing between the bowel and the bladder. Complete exploration by the opening thus made, as well as by the recto-vesical method, proved that there were no internal genitalia. The patient's position was afterwards thoroughly explained to her, and curiously enough the effect on her mind since has been most salutary. Her headaches were proved to be due to severe eye-strain caused by an old unrecognized and high hyperopic astigmatism, which was completely rectified.*

Indications for Treatment.—These, once we decide the cause of the amenorrhœa, are clear. In anæmia—in the first instance, to restore to the sexual organs their normal blood-supply, and correct the constitutional vice predisposing to this morbid state; and secondly, to apply to these organs such local therapeutic means as are calculated to induce or re-establish the natural performance of their functions. We must correct those habits that have a deleterious influence on the general health, and on the sexual organs in particular.

Questions of clothing, diet, exercise, mode of living, and occupations, have all to be carefully gone into. The use of warm clothing; the wearing of light flannel next the skin (vest and drawers); the avoidance of modern devices for strangling the abdominal and pelvic viscera; the securing of due warmth in the extremities, both hands and feet; proper support for the under-clothing—all must be insisted on. It is a good plan for the practitioner to give each patient her individual diet table systematically arranged, omitting all those articles of food which are calculated to cause or sustain dyspeptic states, and which are in themselves likely to deprave the blood. Sufficient quantity of animal food should be given, if necessary, in any of the forms of liquid and concentrated foods, or poultry, game, fish, and milk, according to the digestive powers of the patient; moderation in ordering alcoholic stimulants is advisable, avoiding their careless recommendation or a fanatical denial of their therapeutic value.

Attention to the times of meals and the intervals between them is of equal importance to their character. Speaking generally, light and digestible meals, not taken at long intervals, and never late

* Since the above was written I have seen a fifth case of absent internal genitalia, the vagina being a short *cul-de-sac* an inch in length. Here there was decided disordered mentalization and impending melancholia.

at night, will be found most judicious. We must correct, when possible, those pursuits and their effects which tend to corrupt the blood. Overcrowding in sleeping apartments, ill-ventilated or overheated sitting and bed rooms, prolonged sedentary employment, much stooping or standing, excessive study and long school-hours, want of suitable outdoor exercise and amusement, sustained and violent muscular exercise, as now frequently taken in cycling, have to be firmly condemned.

Decidedly advantageous are those open-air exercises in which nearly all girls at school have now the opportunity of joining. The one point for safety is, that the degree and amount of exercise should be duly proportioned to the individual patient. In certain instances, especially where dysmenorrhœa is associated with amenorrhœa, a full Weir-Mitchell course does good, but this also has to be carefully regulated, with due consideration of the digestive powers, the nervous susceptibilities, and temperament. Not infrequently has this assumed panacea of "blood-making" by rest, isolation, and overfeeding done more harm than good. Like many other so-called "cures," persistence in its application, despite evidences of its unsuitability, ends not in cure but disaster. The danger consists in postponement of surgical measures which alone can cure, and under conditions and circumstances in which delay may be not alone injurious but disastrous.

Suitable hydropathic treatment occupies a prominent place in menstrual therapeutics. The iron spa of which I have personally the most experience is that of Schwalbach, with its carbonated *stahlbrunnen* and *weinbrunnen* springs, which are most indicated in amenorrhœa associated with various forms of anæmia. Spa comes next, but there is something in the air of the Nassau valley, blowing from the Taunus Mountain, 360 metres above the level of the sea, that adds to the effect of the waters; also, as a subsequent resting-place, Schlangenbad is admirable. The moderate altitudes of both Spa and Schwalbach are indicated in anæmia. The more numerous sources of the former give a larger variety of water; and its bicarbonate of iron, with free carbonic acid, is, as in the case of Schwalbach, especially assimilable in those cases of chloro-anæmia, in which iron is often borne with difficulty. Franzenbad and Marienbad have both given me good results; while, in certain cases in which arsenic is desirable, the waters of Royat, in the Puy-de-Dôme, 150 metres higher than those of either Spa or Schwalbach, are scarcely to be excelled. The air is invigorating and stimulating, as are also

the baths, which have to be taken with caution. These are the ferruginous spas, in which I have the most faith; and if a course of electrical baths be indicated, Wilbad-Gastein, with its elevation of 960 metres, its splendid Alpine surroundings and numerous sources, is the one I advise for selection. In certain cases where there are hepatic troubles complicating disorders of menstruation, Plombières has answered admirably, while patients with renal and bladder complications I have found most benefited at Kissingen, Marienbad, Vals, Vichy, or Vittel. For purely gouty complications I prefer Carlsbad, Contrexeville, or Brides-les-Bains. At home we have the waters and baths of Buxton, Bath, Strathpeffer, and Harrogate, which have their special efficacy in suitable cases in which there are indications for the medicinal properties of their respective waters. It is not generally known that there is an admirable iron spa at Felixstowe in Suffolk, the analysis of which shows that it corresponds closely to the *Weinbrunnen* of Schwalbach. Possibly the waters of Tunbridge Wells are also not used as much as they might be, and I have found the Bedfordshire Flitwick water most useful to administer with food. Kreuznach and Salsomaggiore are the foremost absorbent spas on the Continent for exudations, old infiltrations, hyperplastic conditions, and muscular degenerations, but they are not superior to our own Woodhall Spa, nor so convenient of access, and Kreuznach is very relaxing in summer.

The Dangers of Cycling.—The rage for cycling which has developed among women of all classes within the last few years must seriously affect, according as the exercise is abused or otherwise, their health. This may be looked at from two points of view: either from that of its influence on the general health, and thus indirectly on the sexual organs and generative functions of the woman, or, more directly and immediately, on those organs themselves. Imprudence, both in the distances ridden and in the speed of riding, impairs the health, causing both irregularity and irritability of the heart's action, and inducing general constitutional weakness, and, in some instances, anæmia. Obviously, prolonged pressure on the external genitals must affect all the parts from the coccygeal structures to the os pubis. Sufficient time has as yet hardly elapsed to enable us to form an accurate opinion on the permanent effects that may follow in a certain proportion of cases from the constant use of the bicycle. Many women of advanced years now cycle. During the period of the menopause, more especially if they suffer from disturbances in the menstrual functions, cycling may have deleterious effects, and should not be practised without advice, certainly never when there is a natural or erratic period present, or if the heart be functionally affected or the patient anæmic. Those who have backward displacements, or who suffer from prolapse, must

be careful of cycling, if, indeed, they ought to do so under any circumstances. Younger women, who suffer from menstrual irregularities and displacements, or any degree of prolapse, had better not ride while under treatment. There may be exceptions to this rule, but they must be regulated by the individual peculiarities of each case, and by medical advice. Women afflicted with hæmorrhoids should not ride. The young girl who is anæmic, with functional hæmic bruit, should not ride, or should at least be cautioned not to do so to the point of over-exertion or fatigue. All 'scorching' should be discountenanced.

Bathing.—Bathing of the entire body at a medium temperature (water 60° to 70° or 80°), if cold be not well borne, should be encouraged, also sea-bathing if it agree, and if a healthful reaction occur after it. Proper friction is essential, especially of the lower part of the back and the abdomen, after the bath.

Atthill suggested a plan which I have often followed with success. The patient is directed before she goes to bed to sit, protected from cold, in a small bath of water at a temperature of from 60° to 70° . The feet are either placed in hot flannel or in a small foot-can of hot water. After the bath the hips and lower part of the abdomen are well rubbed with a Turkish towel, and then the patient goes immediately to bed.

Therapeutic Remedies.—I briefly tabulate the most important therapeutical means for the treatment of amenorrhœa generally, reserving a few practical observations on some of the more useful of these drugs:—

Iron (and its salts).	}	Chalybeates generally. Separately or in combination.
Arsenic.		
Quinine.		
Nux vomica and Strychnine.		
Ergot and ergotine; ergole.*		
Aloes.	}	In combination with iron.
Myrrh.		
'Celerina.'		
Aletris.		
Tincture of viburnum, and viburnum extract.		
Borax.		
Permanganate of potash—Dioxide of manganese.		
Cannabin tannate.		
Aletris farinosæ extract.		

Other Therapeutic Means.

Galvanism, combined with properly applied massage.
Internal faradization.
Warm hip and foot baths.

* 'Ergole' is a sterilized triple extract of ergot, containing $2\frac{1}{2}$ grs. of ergotin in each 5 minims of the fluid. It is less liable to cause inflammation in deep sub-cutaneous injection than ordinary ergotin (Oppenheimer).

Friction to spine.

Leeches to anus and inside of thighs.

Fomentations to the breasts.

Stimulating enemata.

Iron.—Before administering any form of iron, it is well to prepare the system for it. This is best done by the exhibition of some gentle saline aperient for a short time, such as a natural aperient water, or any of the effervescing saline preparations in ordinary use. For a few days before commencing the iron, an alkaline mixture, of bicarbonate of potash, or Mindererus' spirit (*liquor ammoniæ acetatis*) with *spiritus etheris nitrosi*—the simplest and best saline combination of all—may be prescribed. The diet should be regulated, and heavy meals avoided. Farinaceous food, with milk, should be taken. Sufficient time should be permitted to elapse after meals before the iron is administered; it should not be given while fasting. The particular preparation selected must depend on the features of the case, or the tolerance shown for the exhibition of iron, and the exact effect we are anxious to produce.

The preparations I find most efficacious are hæmoglobin in troches or syrup, reduced iron, which can be given in pill or powder, alone or in combination; dried sulphate of iron, which can be combined with quinine, arsenic, or nuxvomica in pill; the dialyzed solution of iron; the compound iron mixture; tincture of perchloride of iron; the solution of the chloroxide of iron; the compound forms, ammonio-citrate and potassio-tartrate; the effervescing granular preparations in combination with quinine; bromide of iron, when we want iron in conjunction with the bromides, is useful. I have found such preparations as those of Blaud and Blanchard (pills) or the jelloids of Warwick borne when other forms of iron were not tolerated.* The syrups of the hypophosphites of iron and quinine, Fellows' and Easton's syrups, or any of these combinations, Schwalbach, Flitwick,† or Spa Waters, and the preparations of ferrated maltine and beef-iron wine.

Young anæmic patients are best treated by administering a little Flitwick water with food, and a Warwick's 'jelloid' given with an arsenic and iron pill (in the form and strength recommended below), about a quarter of an hour after the meal. St. Raphael wine is excellent in anæmia, and Stearn's wine of the alkaloidal extracts of cod-liver oil, I have found most valuable, a small quantity being given on sitting down to a meal.

Arsenic, through its action on chronic uterine inflammatory states, is perhaps the most useful medicine we possess. The arsenious acid

* The palatinoid form of Oppenheimer is an admirable method of giving these iron preparations. These palatinoids should not be given until almost an hour has elapsed after a meal.

† This Bedfordshire Spa Water is an admirable chalybeate—a tablespoonful is sufficient with meals. The *liq. arsenicalis* can be given with it.

($\frac{1}{36}$ to $\frac{1}{50}$ of a grain) may be well administered in pill, in conjunction with either quinine or iron, three times daily after food. Fowler's solution, as a fluid preparation and capable of combination, answers well. The peculiar susceptibility of some individuals to the effects of arsenic, as seen in irritability of the stomach, erythematous attacks of the skin, and inflammatory conjunctival states, is not to be forgotten when we are giving it for the first time to a patient.* **Quinine** we may combine in administration with any medicine indicated for amenorrhœa. It may be given either with arsenic or iron, aloes and myrrh, ergotine, or nux vomica in the form of pill, or with various effervescing salts of iron; or the vegetable infusions, and any of the many elegant forms in which quinine is now prepared. The preparation hydrochloride of quinine can be conveniently given with the tincture or solution of the perchloride of iron. **Nux vomica**, next to quinine, is perhaps the most valuable vegetable tonic we possess; more especially it is of service in the atonic and debilitated conditions associated with suppressed menstruation.† It may be taken in the form of extract, with either quinine, arsenic, or iron, in $\frac{1}{6}$ to $\frac{1}{4}$ grain doses, three times daily, after meals, or at times combined with ergotine. It is particularly indicated in those sluggish states of the bowel that we so frequently find complicating amenorrhœa. Here it can be added to an aloetic pill. But the most reliable mode of administering this drug is as the liquor strychniæ of the Pharmacopœia. It is better to prescribe a standard solution, so that the half-ounce dose contains a given quantity of the drug. With glycerine and the dialyzed preparation of iron it forms an excellent mixture, to which the tincture of quinine may, if we so desire, be added. **Ergotine**, as an emmenagogue, is a useful adjunct to any of these medicines. It can be given ($\frac{1}{2}$ gr.—gr. i. doses) with quinine and nux vomica. Ergot and most other therapeutic agents act chiefly as emmenagogues. Borax in 10 grain doses I have occasionally found of service. It is best administered by itself in the form of powder. **Apiol** capsules are of use, especially if there be dysmenorrhœa, and have a similar action to ergot. The recent combination of apiol and ergot in capsule form is an efficacious

* The Bipalatinoids or pill contains—

Ferri sulph. exsicc gr. i.

Quinæ sulph. gr. i.

Acid. arsenios, gr. $\frac{1}{36}$ to $\frac{1}{50}$.

Ext. nucis. vom. gr. $\frac{1}{6}$.

† Easton's syrup is conveniently given in the form of a palatinoid.

one. Dioxide of manganese, in the form of palatinoids, may be tried with advantage. (See below.)

With regard to the uterine sound, before we take it up to induce a menstrual act, we must have positively assured ourselves of the absence of pregnancy. Seeing the ill uses to which it is put, I do not approve of its employment as a means of treating ordinary amenorrhœa. I am certain that practitioners have a more efficacious means in electricity, though here, of course, the same rule holds good as regards the elimination of pregnancy.

In the chapter on electro-therapeutics various vaginal and uterine electrodes are shown, and the methods of using these are described. I have abandoned the use of galvanic stems. The different forms are to be seen in any instrument-maker's catalogue.

If a galvanic stem be inserted, the uterine canal must be sufficiently dilated to permit of its passage, and the stem passed into the canal on a stem-introducer, either by the direction of the finger or the aid of the speculum. The patient should be placed in the semi-prone position and the duck-bill speculum used. The uterus may then be brought well under control with a uterine hook, and the stem inserted; it ought not to be long enough to touch the fundus. It should be withdrawn if pain be complained of.

Some Special Therapeutic Agents.

Aletris Farinosa.—This drug will be found useful in cases of associated amenorrhœa and dysmenorrhœa, also in erratic menstruation; 20—30 drops of the liquid extract may be given alone, or combined with tincture of digitalis, or with viburnum and caulophyllin in palatinoid.

Aletris Cordial.—This patent preparation I have found of use in several instances, given either alone or in combination.

Viburnum Prunifolium.—The liquid extract of Viburnum Prunifolium and its tincture may be combined with advantage with both Aletris and Hydrastis.

Dioxide of Manganese.—This most valuable medicine for amenorrhœa, in anæmic and chlorotic cases, and in emansio mensium generally, may be given in gelatine pills, or in palatinoids, which I find more convenient. I give two palatinoids three times in the day (each palatinoid containing grs. ii. of manganese dioxide), also others containing gr. i. of senecin in addition.

Liquor Caulophylla (Pulsatilla).—I have tried this preparation on several occasions. Its effect has been variable. It has answered well in some cases of dysmenorrhœa with scanty flow. I have found it more efficacious when given in combination with '*Celerina*.' I can recommend this latter preparation not alone as an emmenagogue, but as a general tonic. I have frequently given it with vascular tonics, and with the best results. *Celerina* is well administered with Horsford's Solution of the Acid Phosphates, or the Syrup of the Hypophosphites. (*Celerina* contains celery, coca, kola, viburnum, grs. v.—ʒi.) Liq. caulophyllin et pulsatillæ are combined under the name of '*colefina*.'

Santonine.—Whitehead and Hannah found that santonine in 10-gr. doses is an efficient emmenagogue.

Senecio Aureus.—This is a valuable drug. Its tincture may be given in combination with other remedies or the alkaloid senecin in the form of palatinoid. These contain also lupulin, ergotin, caulophylin.

Massage.—Massage is a powerful aid to treatment in amenorrhœa and dysmenorrhœa. It may be general, but more specially directed to the lumbar and sacral regions or the gluteal muscles. Its use may be combined with the warm bath of sea-salt or pine, and galvanism.

Leucorrhœa.

Of all terms used in gynæcology, this one—leucorrhœa—is employed in the loosest and most misleading manner, both by student and practitioner. By leucorrhœa we understand generally, in practice, what women call ‘the whites.’ If we restrict the use of the term to simple exaggeration of the normal secretions, whether coming from uterus, vagina, or vulva, or to some catarrhal state of the mucous membrane, it would be, perhaps, correct to speak of uterine (corporeal and cervical), vaginal, and vulvar leucorrhœa. But it must be remembered that simple excess of the normal physiological secretion rarely continues for a length of time without inducing pathological changes in the tissues, which are quite distinct from a slight perversion of simple exaggeration of secretion. Simple ‘leucorrhœal flow’ we meet with, typically, in pregnancy, in young girls with debilitated constitutions, and in those suffering from anæmia. To mix up the idea of any pathological change in the tissues with ordinary leucorrhœa is simply to lead the practitioner into errors both of diagnosis and treatment. On the one hand, he may resort to unnecessary examinations, overtreat by local measures, apply topical agents to healthful structures, or raise unnecessary alarm. On the other, he may be tempted to pursue an expectant plan of treatment, hoping in vain that he can control a discharge which has its source in some diseased state of the uterus by palliative measures and general constitutional remedies.

Simple Leucorrhœa.—In the table of discharges is epitomized the distinctive features of the secretions poured from the uterus—body or cervix—the vagina, and vulva. In some cases simple leucorrhœal discharge is very profuse; perhaps it altogether supplants the normal menstrual function. This form we are frequently consulted for in connection with either amenorrhœa or some irregularity of the menstrual flow, and its accompanying anæmic or chlorotic condition. We also meet with it as a symptom in gouty, rheumatic

syphilitic, and tubercular constitutions. In leuco-phlegmatic children, occasionally—apart from the discharge of vaginitis—after the exanthemata, or associated with worms, and during dentition, we find a true leucorrhœal discharge. Though in anæmic or chlorotic girls a vaginal examination is generally unnecessary, much careful discrimination has at times to be exercised.

There is such a contingency as the following: A very intelligent young practitioner brought to me an unmarried girl (accompanied by a married sister), suffering from amenorrhœa, with attendant anæmia, gastric symptoms, leucorrhœa, flatulence, etc. She had taken various remedies without avail. No examination had been made. I hinted at the possibility that she might be *enceinte*, but was assured it was out of the question. The chances of a flexion or version being present suggested a digital examination. I was surprised to find the girl far advanced in pregnancy. Insisting, then, on making a complete examination, we were satisfied she was at least in the eighth month of pregnancy. She had so laced and dressed as to deceive all about her, including her mother, married sister, and physician. The story tells its own moral.

When, from other symptoms, we are led to suspect some inflammatory condition, or a version or flexion, a digital examination is called for. In a married woman it is always the safest course to examine the uterus when we are told that she ‘suffers from the whites.’

Our treatment has to be determined by the general aspects of the case. The different modes of restoring the general health, by chalybeates, tonics, attention to diet, and exercise, already pointed out in the treatment of amenorrhœa, must be resorted to.

As to local measures, we may do much by the vaginal douche, astringent and alkaline injections, more especially those of alum, sulphate of zinc, sulpho-carbolate of zinc, borate of sodium, with glyco-thymolin. In children we must pay attention to the general health, and give some alterative, as small doses of rhubarb, hydrarg. c̄ creta and quinine; also, the various chalybeates—a course of syrup of iodide of iron, Fellows’ syrup, or Parrish’s food. The child’s diet should be regulated, and she should have proper baths, sea-bathing, and warm underclothing.

Simple uncomplicated leucorrhœa rarely produces irritation of the vulva, pruritus, or eczematous inflammation, while we frequently find such conditions attendant upon vaginitis and discharges of a purulent or acrid nature, both from the uterus and vagina. (See ‘Vaginitis.’) Should these exist in children, however, scrupulous cleanliness should be enforced, and the vulvar orifice inspected regularly, lest there be any irritation consequent upon the discharge.

CHAPTER VIII.

DISORDERS OF MENSTRUATION (continued).

Dysmenorrhœa.

Pain.—Such pathological states as congestion, and associated obstruction, attended by more or less spasm, are constantly met with. In a large group of cases we find a tendency to amenorrhœa and scanty menstruation. The pain here is clearly associated with anæmia. In another the tendency is rather to plethora and congestion. So also the situations in which the pain occurs are variable; in the ovarian region, and along the inside of the thighs, if the ovaries, as is frequently the case, should be the organs most at fault; pain in the back and over the pubes, if the principal cause of the dysmenorrhœa be in the uterus. Reflex pain in the head, chest, or abdomen, accompanying the local pain, is present, in some degree, in most cases of chronic dysmenorrhœa. Equally uncertain are the nature of the pain and the time of its occurrence. It varies from some slight aggravation of the common systemic disturbance antecedent to the menstrual flow, with pain referred to the back or sides, disappearing when the discharge appears, to the indescribable agony which the friends of the patient say ‘they can only compare to labour pains.’ The pain may precede the flow, and cease as this commences, or it may last all through the period, exhausting the woman physically and mentally. It is in such cases that the mind after a time is weakened, each period causing further prostration, until at last delirium is present, or perchance some permanent form of mental aberration results.

Hysteria.—The term ‘hysterical’ is often wrongly employed to describe the pain complained of in these cases; so also a special class of pain is loosely spoken of as ‘neuralgic.’

Both terms are apt to mislead in practice. It cannot be doubted that a large amount of the pain complained of by some may be included in the general state known as hysteria, and with the type of pain looked on as neuralgic. And it is likewise true that the mental condition of the woman leads her to exaggerate the suffering and describe it in extravagant language,

while her weakened nervous system cannot sustain any acute or prolonged pain. This is still further accentuated by the recurring anticipation before each period. But if such considerations influence a practitioner to regard any form of pain as fanciful or unreal, and induce him to look on his patient as 'whimsical' and, as he is commonly pleased to say, 'hysterical'—though what he may mean by this latter generalization he would often find it very hard to explain—he will make a serious mistake. It may lead him to trifle with the source of the disorder in the ovary, uterus, vitiated state of the circulation, or depraved nervous system. *It is the safest rule in practice never to despise pain, no matter how trivial, and always carefully to seek for the cause of it.* Not the less must we do so because we feel convinced that our patient's mental powers are weakened.

It has been reported that women who have suffered agony from ovarian dysmenorrhœa were completely relieved by the deception of an incomplete oöphorectomy. When placed under chloroform, only the preliminary cutaneous incision has been made. I have seen the application of a metal disc over the ovary relieve ovarian neuralgia. Not long since I had a patient who, for some time, had had morphia injected subcutaneously for the relief of ovarian and other pains : she suffered from most severe dysmenorrhœa. Occasionally she craved for the morphia. By the justifiable deception of seeming to yield to her entreaty, while only pure water was used, she had a good night's rest, and expressed herself as completely relieved the next day.

We have no stronger proof of psychical influence over physical conditions than in the various applications of metallo-therapeutics, and the strange effects of metal discs applied for the relief of hysteria and hystero-epilepsy.

I by no means desire to be understood as doubting the conclusions of the late eminent French psychologist, Charcot. I think that in ocular therapeutics, and in the effects of the metals when applied for various retinal states, we have evidence of the direct physical results of metallotherapy. I refer to the work of the Salpêtrière physician rather to impress on the student's mind the double-sided nature of most ovarian disorders. On the one side, physical, from the slight congestive and hyperæsthetic to the various pathological conditions met with ; on the other, psychical, as seen in all the so-called hysterical affections and states, complicating both the normal act of ovulation and any abnormal departure from the healthful performance of the ovarian function.*

Charcot originally took the view that the ovary is the *point de départ* of the paroxysm in the attack of hysteria and hystero-epilepsy—moderate pressure over the ovary inducing the aura hysterica, while more energetic compression arrests it, and also cuts short an attack, even when the convulsions have commenced. Pressure is made and maintained by the closed fist, which is pressed into the iliac fossa. Grailly Hewitt drew attention to the fact that this pressure also acts on the uterus, compressing its vessels, and diminishing uterine congestion. He regarded uterine displacements as having more to say to the hysterical phenomena than the dislocation of the ovary. Epileptic fits are sometimes stopped by pressure in *males* in the inguinal region. This acts on the sacral plexus of nerves, and the explanation is probably the same in some women.

* Consult chapter on Oöphorectomy.

From what has been said, it may be gathered that I regard as of doubtful scientific accuracy any classification which has been made of dysmenorrhœa; yet here, as in other efforts to classify affections between which no well-marked lines of demarcation exist, we gain much in clinical diagnosis and treatment from the grouping of ideas resulting from a classification, though it may not be critically accurate. Broadly, we keep always in our mind, in practice, the dysmenorrhœa which has its source in the ovary and its appendages rather than in the uterus. The pain is characteristically ovarian, and we seek for congestion, swelling, sensitiveness, and displacements of the ovary. There may be adhesions or effusions, and localized swellings in the broad ligaments or Fallopian tubes. On the other hand, we may find on examination, a satisfactory explanation of the suffering in the malformation of the uterus, in the congested cervix, the contracted uterine canal, some flexion or version, or an inflammatory state of the mucous membrane of cervix or fundus. The relation of ovary to uterus is too close to expect that this distinction of ovarian and uterine dysmenorrhœa should be clinically marked in a large number of cases. Thus we have the affected ovary reacting on the uterus, and any serious inflammatory affection of the latter organ influencing the former. But we are constantly meeting cases of dysmenorrhœa in which we can detect no mischief either in the ovary or uterus. They are normal in size, position, and freedom from adhesions; there is no fault in the patency of the uterine canal. Here we must look to the circulation or nervous system for the cause of the pain. This is traced either to the depraved quality of the blood, as in some anæmic state on the one hand, or to excessive blood-supply—a general plethoric condition of the system—on the other.

Pigmentation.—The pigmentary changes that occur contemporaneously with the menstrual act have been noticed by various writers.

Vasomotor Coloration of the Face, with Pigmentary Changes associated with Abnormal Menstruation.—A girl, twenty-two years of age, suffered from the most severe dysmenorrhœa and oöphoralgia. This had lasted for some three years, and first came on after a shock. There was a conical cervix, with the ordinary pinhole aperture. The cervix was divided, and she wore an intra-uterine stem for a short time. The operation had no material effect on the dysmenorrhœa. Both faradization and galvanism were tried, also without effect. The curious discoloration of the face was much more marked than in the ordinary menstrual chromidrosis or pigmentation of the lids. On two occasions I have seen the cheek ecchymosed exactly as if it had had a severe contusion from a blow, passing subsequently through the various phases of

PLATE XIII_A.



VASOMOTOR COLORATION OF FACE WITH PIGMENTARY CHANGES ASSOCIATED
WITH VIOLENT DYSMENORRHEA AND OÖPHORALGIA. (AUTHOR.)

[*To face p. 188.*

coloration. The circles under the lids, extending below the malar bones, often varied in hue, and these changes were frequently very rapid, varying from purple to a deep greenish black. Sometimes the forehead became involved, and the whole face assumed a purplish colour, the conjunctivæ sharing in the suffusion. These changes generally preceded the catamenial epoch, becoming intensified during its occurrence, and disappearing slowly after its close. The case was quite distinct from any I have previously seen. For example, in the instance of a lady who was under my care for some time, several of her female friends thought that the black circles were artificially produced. So black were they that they had the appearance of being produced by Indian ink.

Menstrual Congestion of the Dental Pulp.—Régnier * instances a case of a lady who had a carious tooth plugged with platinum, the pulp being exposed while the cavity was bored out. Every month thereafter, exactly at the time of menstruation, she had severe neuralgia in the affected tooth, lasting for forty-eight hours. The only satisfactory explanation seemed to be that there was a periodical congestion of the pulp, causing it to swell and press against the filling, thus producing neuralgic pain.

Ocular disturbances during menstruation are very common (see remarks on the 'Ophthalmoscope in Diagnosis').† See chapter on 'First Steps of Examination.'

'Genital Centre' of the Nose.—Schiff,‡ Fliess, Jaworski, Jwanicki, Chrobak, and others,§ recognizing the relationship between the turbinal and the reproductive organs, as evidenced by various nasal reflexes occurring during the catamenia and during times of sexual excitation, have treated dysmenorrhœa by the application of cocaine or a supra-renal solution, and galvano-cauterization of the 'genital spots.' They have also used trichloracetic acid to the turbinals, and with considerable success. The dysmenorrhœa, especially in those cases which were not dependent on inflammatory causes, was relieved in a large proportion of those affected. In one case in which I divided the cervix for stenosis and secured free patency of the canal without any effect, cauterization of the turbinals completely relieved the dysmenorrhœa.

Congestive and Obstructive Dysmenorrhœa.

Predisposing Causes of Congestive Dysmenorrhœa.—Plethora; arrested or suppressed menstruation; inflammatory states of the

* *Révue Médico-Chirurgicale des Mal. d. Femmes*, Dec., 1891.

† Ocular neuralgia, exaggeration of refractive disorders, slight attacks of optic neuritis and retinitis, etc.

‡ *Sem. Méd.*, July 16, 1902.

§ Cox, *Brooklyn Med. Jour.*, July, 1902.

uterus and endometrium ; displacements of the uterus ; subinvolution ; fibroids ; polypi.

Symptoms.—Pelvic pain frequently precedes the appearance of the menstrual flow, or continues during the period. It is generally aggravated previous to, and for the first twenty-four hours of, the discharge ; the pain may be accompanied by constitutional disturbance. The uterus may be found swollen, tender, and sensitive both to external pressure and internal examination ; on a vaginal examination with the speculum we frequently find the characteristic and exaggerated discharge of endometritis blocking up, or hanging from, the os uteri.

Predisposing Causes of Obstructive Dysmenorrhœa in the Ovaries and Fallopian Tubes.—Simple congestion, ovarian apoplexy, acute ovaritis, morbid changes in the corpora lutea, cystic degeneration, cortical and interstitial sclerotic changes, gonorrhœal inflammation, cirrhosis, adhesions, morbid changes in the position or the lumen of the Fallopian tube, due to inflammations, adhesions, strangulation or cystic disease.

In the Uterus.—Mechanical obstruction to the flow of the menstrual discharge, due to stenosis of the cervical canal or os uteri ; congenital malformations ; uterine displacements which cause a narrowing and bending of the canal, and which favour interstitial effusions into the cellular tissue of the uterus, with resulting hyperplasia and contraction ; traumatic—operative measures which result in stenosis ; polypi and interstitial fibroids.

Menge of Leipzig holds the view that dysmenorrhœa is due to contractions of the uterus consequent upon pre-menstrual swelling of the mucosa and the presence of blood. Such contractions may not be felt in health, but in hysterical and neurasthenic states, as also in diseases of the genital and pelvic organs, they become painful.*

Symptoms.—The most prominent symptom is pelvic pain, varying in intensity, often agonizing, preceding and accompanying the menstrual discharge. There may be severe constitutional disturbance, violent headache, and sickness of the stomach. The mind may be weakened by the recurring agony, and delusion may follow, or the patient even become maniacal. Pelvic peritoneal symptoms are frequently present, as also considerable ovarian irritation, with pain and sensitiveness of the ovaries ; neuralgic pains in the groins ; attacks of uterine colic and spasm ; hysterical tendencies. Vicarious hæmorrhage may occur elsewhere, as retinal infarctions and

* *Central. f. Gyn.*, 1901, No. 50.

effusions, epistaxis, hæmatemesis or hæmoptysis. In some patients the blood becomes depraved, the patient is anæmic or chlorotic; the skin acquires a yellowish-green or discoloured look. It may be that many of these symptoms are in abeyance until the increased sexual activity and local determination and excitement, consequent upon marriage, react on both the ovaries and uterus. Thus frequently we find the first great distress and pain complained of after marriage.

Obstructive and Spasmodic Dysmenorrhœa.

We speak of 'obstructive' as distinct from 'atresic'—*i.e.* more or less of mechanical obstruction to the menstrual flow due to congenital or acquired contraction, or partial occlusion of the uterine canal quite apart from atresia of any part of the genital tract, whether of Fallopian tube, uterus or vagina, or imperforate hymen. The two conditions must always, both for etiological and clinical considerations, be kept distinct. The congestive and obstructive forms of dysmenorrhœa touch each other closely, both from a pathological and clinical point of view. Congestion leads to obstruction, while impediment to free flow tends to congestion. Contraction of the uterine canal is a result common to the congestion that follows a version and flexion, a hyperplastic effusion, a growing fibroid, and an inflammatory state of the endometrium. More of the nature of an obstacle to discharge is the presence of a small polypus. This possible, and indeed probable, cause of dysmenorrhœa is too often overlooked, and dilatation and exploration of the uterus consequently neglected—steps as beneficial from a therapeutic point of view as are essential from a diagnostic. Traumatic contraction gives us the same results when it occurs from operative interference or rash therapeutical applications.

These varieties of dysmenorrhœa are, I think, rightly distinguished from that which is the consequence of stenosis associated with congenital malformation of the uterus, as recognized in the characteristic conical cervix and pinhole aperture, or any of its varieties, or the imperfectly developed uterus with short cervix. Yet, as we are classifying a symptom, and not a pathological condition, we must be satisfied to include this frequently occurring misfortune under the heading of 'obstructive.' For my part I prefer the classification already given (p. 171).

Thus uterine '*congestive dysmenorrhœa*' would include simple congestive conditions and plethoric states; '*uterine obstructive*,' such impediments as polypus and fibroid tumours, traumatic contraction; flexions and

versions; *inflammatory dysmenorrhœa*—endometritis and metritis; *congenital* dysmenorrhœa resulting from malformations causing atresia or stenosis of the os and cervix; quite apart from these are those circulatory causes found in anæmia, chlorosis, 'toxæmia' and other depraved conditions of the blood.

In the classification I have given I have not included that form of dysmenorrhœa generally described as '*spasmodic*.'

Every practitioner will, however, meet with cases of dysmenorrhœa in which he can find no satisfactory reason for the pain in any abnormal state either of uterus or ovary. Even if there be a version or flexion, he finds that the uterine canal is pervious; he rectifies the displacement, and still the pain recurs. There may be some congestion of the uterus, and ovarian tenderness, or hypersensitiveness of the internal os on passing the sound, yet not sufficient to explain the violent spasmodic pains that precede or accompany the earlier appearance of the menstrual discharge. We notice occasionally, as characteristic of this form of pain, that the patient states that some clots have passed, and that on the appearance of these the pain has been relieved. The passage of these clots may be followed by a profuse, or rather prolonged flow.

1. Is there such a distinct cause of the dysmenorrhœa in uterine spasm as to warrant our regarding uterine contraction as a special form of painful menstruation, and either pathologically or clinically distinguishable from other forms?

2. Is it correct to assert that the pain has its *source* altogether in the uterine spasm, and not in the mechanical effects of congestive closure, contraction of the canal from flexion, or congenital stenosis?

The truth of the mechanical theory of the pain of dysmenorrhœa was altogether disputed by the late Matthews Duncan. His views may be summarized thus:—

'The most characteristic form of dysmenorrhœa is spasmodic;' it is 'of the nature of a neurosis;' is synonymous with neuralgic, and is 'in its essence' due to 'morbid contractions of the uterus, occurring in connection with menstruation.' These contractions are clonic; they 'come in pangs,' and when the pain is incessant it is because the uterine contraction is tonic. He regarded as analogous conditions the after-pains of pregnancy and spasmodic asthma. He laid down that 'nothing can be more erroneous' than the statement 'that flexion of the passage obstructs the discharge of blood.'

He thought that bad pathology which regards an extreme flexion as the cause of damming up of blood in the body of the uterus, and the usual consequences that follow from such blood accumulation. The fact that a woman has not violent dysmenorrhœa after the first two days of menstruation, as a rule, he considered subversive of the mechanical theory. Its periodicity and the influence of climate on the pain still further, he held, upset the obstruction theory. In short, he ignored the influence of flexion, version, pin-point os

uteri, and stenosis, in producing the dysmenorrhœa. If these views be correct, obviously much of the modern teaching is erroneous, and must be abandoned. I have to confess that I cannot agree with them, for the reason stated in the text.

There is certainly a strong analogy between the pain in uterine obstruction and that which is, in the male, the result of urethral congestion, strictured conditions, and gouty urethritis. In the urethra, as in the cervical canal, it is not necessary that there should be any considerable contraction to produce spasmodic closure. We can pass a large-sized bougie through the urethra of a patient who a minute before could not void a drop of urine. The *pain* is the pain caused by retention of urine rather than by spasm. When we overcome the obstruction (in this case both congestion and spasm) the pain disappears. Various degrees of flexion are doubtless at times to be met with in women who have never suffered from dysmenorrhœa. Take such a case as the following :—

A lady, aged thirty-one, married nine years; had two early abortions shortly after marriage; continued regular both in quantity and periodicity of discharge since; has never, since she was sixteen, been irregular, nor has she at any time suffered pain. Her husband, a medical man, induced her for the first time to submit to an examination to ascertain if there existed any cause for the sterility. She was a highly nervous woman. On examination, I found exaggerated ante flexion of the uterus, which was evidently of old standing. The uterus was not enlarged, nor was it sensitive. The os was normal. Here the flexion had caused neither congestion nor obstruction, nor apparently any local derangement of the uterine nerves.

In men the irritation of a gouty blood current causes spasmodic closure of the urethra, and produces obstruction. It is periodical, and is relieved by change of diet and hygienic measures. An abnormal condition of the tissues and nerves of a sensitive part may cause acute reflected pain elsewhere. Witness severe urethral pain with hæmorrhoids, and remote pains in the extremities from stricture of the urethra. In asthma, instanced by Duncan, the pain or distress is distinctly induced by the impeded blood current, and we have to look altogether beyond the phenomenon of spasm for the primary reason of the obstruction. Doubtless certain uterine contractions are painful, but all are not so, as, for example, those which occur throughout pregnancy, and of which the woman is unconscious. These are purely physiological; they are not pathological, like those of dysmenorrhœa, or, for the matter of that, like the after-pains of labour, in which we often have obstruction, and where there is a foreign body to be expelled. To neither of these contractions can we apply the term 'morbid.'

In those exceptional cases in which we can, on examination, find no abnormal state to explain the dysmenorrhœa, we may feel certain that *it is for the simple reason that we have not been able to discover it*. The subtle relationship of ovary and uterus is sufficient to account for sympathies and reflex acts that we can find no physical explanation of. We must allow that it is the exception

to meet with any severe case of 'spasmodic dysmenorrhœa' without some attendant abnormal state of the uterus or ovary to explain it. Malformed cervix, contracted cervical canal, congenitally small uterus (one in which a healthful act of ovulation fails to find its external physiological expression in the proper menstrual flow), endometritis; a flexed hyperplastic and hypertrophied uterus, or one imprisoned by a cellular effusion, and various abnormalities in the size, feel, position, sensitiveness, of one or both ovaries or tubes—all are found associated with the spasm. For these and other reasons, which I do not stay to give here, I believe the term 'spasmodic dysmenorrhœa' to be misleading and unscientific. I still adhere to the opinion that spasm is an accessory symptom in most forms of dysmenorrhœa. That it accompanies the pain is true, but it is the consequence of the various pathological states I have referred to. And when we come to ask what light is thrown by treatment on the nature of this affection, I think it tends to prove the obstructive theory. The relief afforded by dilatation of the canal by tent or bougie, division of the cervix, the posterior section of Sims, Dudley's operation, galvanism, suitable intra-uterine stems, or such medicines as apiol, castor, and various other therapeutic remedies, supports the older view that the spasm is a consequence either of some morbid condition in the circulatory current in the uterus, its nerves or tissues, or it is due to a congenital, if not acquired, contraction of the uterine canal.

In suitable bougies we have a ready means of securing safe and rapid dilatation of the uterine canal.

The bougies I have devised possess the advantage over Hegar's, that from their shape and curves they are easier of insertion and manipulation, and the twelve sizes, carefully graduated, meet all the wants of the surgeon (Fig. 68).

The time is approaching when for all such cases sea-tangle and tupelo tents will be generally discarded for instrumental dilatation. Still, there are cases in which the practitioner may not feel himself justified in resorting to the force necessary to dilate a small cervical canal. Here aseptic laminaria has to be first used, and subsequently the metal or other dilators.

General Treatment of Dysmenorrhœa.—In determining the treatment of a case of dysmenorrhœa, we must be guided by the cause of the pain, and our remedies should be such as are indicated by the constitutional aspects of the case, and any local fault that we may detect. Our first aim should be to correct the constitutional vice,

such as general plethora, anæmia, chlorosis, dyspepsia, gout, hysteria, constipation, and those habits which lead up to depraved blood conditions and interfere with the general health. Attention to all those matters already referred to in the instance of amenorrhœa will be necessary—climate, food, clothing, exercise, and abandonment of injurious amusements, occupations, or morbid excitements. Change of air, proper exercise, healthful and regular diet, with attention to the bowels, will cure many a case of dysmenorrhœa without further interference. With anæmic and chlorotic complications, the different chalybeates before referred to, and especially the combination of arsenic, iron, and quinine, must be tried. If we should be suspicious of a gouty diathesis (and ‘latent gout’ as a source of dysmenorrhœa should always be kept in view), the salts of potassium, lithia, soda, magnesia, are indicated, and these can be given with the bromides of potassium and ammonium, or with colchicum or guaiacum. The preparations ‘piperazine’ and ‘uricidine’ are specially of service. The latter is a most powerful uric acid solvent. The salicylates of quinine, lithia, or soda (effervescing or granular) will be found agreeable and useful preparations. The combination of the three bromides of potassium, sodium, and ammonium, is most valuable. Amongst the English spas, those of Buxton, Bath, Cheltenham, Harrogate are useful, as is also that of Strathpeffer, in Scotland. The main point to be remembered in advising a foreign spa for dysmenorrhœa is to determine the constitutional vice that may be present, and to select the waters accordingly. Kissingen, Vittel, Plombières, if there be gouty states; Contrexéville and Vichy, if the uric acid and oxalic diathesis be present; Marienbad and Franzenbad in anæmic and hepatic cases, Schwalbach and Spa for anæmia and spanæmia. In atonic conditions of the bowels attended with flatulence, tincture of nux vomica in glycerine, with such carminatives as the compound tincture of chloroform or the spirit of lavender, will frequently relieve; aloin, nux vomica, and belladonna with an essential oil, are at the same time given in pill form. In dyspeptic cases, if there be gastric acidity, the salts of bismuth in combination with carbonate of soda, papaine and pepsine, lactopeptine, and taka diastase, are indicated.*

Aperients.—For constipated bowels, if we find that laxatives and

* As a digestive aid in such cases this is a useful form: R. Papain, taka diastase aa ʒi.; lactopeptine, sodii carb. aa ʒvii. Twenty grains may be given in cachets, or be taken in a small sandwich of bread and butter at the close of a meal.

mild purgatives fail to operate, the occasional resort to an enema should be advised.

The pulvis glychrrhizæ co. of the German Pharmacopœia, in doses of 30 grains to a drachm, may with advantage be given as a mild but effectual laxative in the mornings.

Glycerine enemata and suppositories are a valuable means of relieving the bowels. From ʒss.—ʒi. is administered by means of the proper rectal glycerine syringe. It is convenient to attach a narrow rubber tube to the small syringe, so that the patient can administer the enema lying on her back. I generally order equal parts of water and glycerine, ʒss.—ʒi. of each. In some instances we have to abandon glycerine enemata on account of the pain they cause. Frequently they produce a burning sensation in the rectum. Oidtmann's purgative is a suppository of soap, glycerine, and rhamnus frangula. Glycerine suppositories can now be had of any chemist, and of any strength desired.

Cascara sagrada palatinoids can be given at night, a dose of Rubinat water being taken the following morning—three-quarters of a wineglass, with a tablespoonful of hot water added. The liquid extract of cascara sagrada (liquid extract of cascara, ʒi.; glycerine, ʒi.; water, ʒvi. (ʒss. as a dose)) may be preferred. The syrup of figs (Californian), for cases of slight constipation, acts well, and without causing any griping. Sulphovinate of soda is a very valuable aperient for some women (especially during pregnancy). A dessert-spoonful is given with a teaspoonful of syrup of lemon, and half a tumbler of seltzer-water, which is added from a syphon. A teaspoonful of psyllium seeds taken at breakfast in a little tea or coffee, and repeated at luncheon if necessary, is quite sufficient with some.

Of the natural waters, Hunyadi Janos, Æsculap, and Rubinat are the simplest, and, if they act, the best saline aperients we have. They should be taken early in the morning in a little warm water. Generally a small cup of warm tea or coffee, drunk immediately after, will assist the action. A mild alterative or aperient pill can be taken the night before. With many, a Tamar confection acts as an aperient. Habit has much to say to constipated bowels, especially in women. We should insist on a daily effort being made to relieve the bowels, and often a drink of cold water at, or after, breakfast will help. A moist pack, worn over the abdomen at night, made of a few layers of lint wrung out of tepid water, and covered with an oiled silk pad, I have frequently known to assist the action of the bowels. So far as possible, we should avoid drastic purgatives, or encouragement of the constant use of every variety of 'aperient pill.' Brown bread, softer food, fruit and vegetables,

with some simple assistance, as the seeds of psyllium, will generally obviate the necessity for so injurious a custom.

Dilatation of the Sphincter Ani.—In many cases of most obstinate costiveness, in which, for a considerable time, the bowel could only be moved by enemata, dilatation of the sphincters under ether has been followed by permanent cure. The lower bowel is emptied by an enema, and washed out with boric acid solution. The sphincters are then dilated with the hand in the manner before described. After the rectum has been washed out, an enema of salad oil is administered. This is repeated the next morning, and the patient is given nightly a pill of nux vomica, belladonna, and cascara. The dilatation may be assisted by a galvanic current used over the course of the colon daily.* This is well supplemented by abdominal massage, administered in the knee-elbow position in the course of the colon, the masseuse operating from behind.

Sedatives and Hypnotics.—If the pain be referred particularly to the region of the ovaries, and assume a neuralgic type, the bromides of sodium, potassium, and ammonium are indicated. An excellent combination is that of bromide of potassium (gr. xv.), and hydrate of chloral (gr. xii.), given at intervals of four hours when the pain is felt. An enema of chloral and bromide of potassium will be found of service. Tincture or extract of cannabis indica, tannate of cannabin, humulus lupulus, castor, lupuline, monobromate of camphor, apiol (in capsules), nepenthe or codeine at night, or the subcutaneous injection of morphia, are all of use to subdue the pain. The '*aletris cordial*,' '*liquor sedans*,' and '*celerina*' are valuable combinations; the first, combined with other uterine hæmostatics, in menorrhagia; the second, for the pain of dysmenorrhœa; and the third, as a useful tonic which can be given with iron and other preparations to those who are debilitated by excessive losses or suffering. Indispensable in those cases both of amenorrhœa and dysmenorrhœa in which we have cardiac irregularity, enfeebled action, mitral stenosis (or at times in aortic stenosis), in the absence of compensation, are *the vascular tonics*, strophanthus and digitalis. They can be given in menorrhagia and metrorrhagia with hydrastis and ergotine. Digitalis has the great advantage of its action in producing contraction of the arterioles, and is well given with the tinctures of aletris, viburnum or hydrastis, and with 'ergole' or sclerotic acid. Some of the legion of preparations of the coal-tar series may be tried—antipyrin, antifebrin, 'analgen,' 'antikamnia,' 'ammonol,' all have been used with varied success. Sulphonal and trional are most valuable hypnotics, and in hysterical

* The 20-cell battery of the Silvertown Company, London, is the best for daily use. It lasts without any need for renewal for one or two years.

cases, as a rule, produce sleep. A suppository of trional is an admirable method of administering the drug (each containing fifteen or twenty grains). Chloralamid, in doses of twenty to thirty grains, has many advantages over other hypnotics; it has no after-effects.

Paraldehyde* in drachm doses may be given in dysmenorrhœa, or urethane in twenty to thirty grain doses; but though useful as hypnotics, they have little effect in relieving pain.

Thyroid Extract.—Thyroidine has been given with good results by Stinson, who regards it as a uterine and ovarian anodyne having a specific action on the vasculo-motor nerves of the uterus and ovaries.†

The Morphia Habit.

Hysterical and Neuralgic Cases.—Abuse of Morphia Injections.—There is a strong objection to resorting to the subcutaneous injection of morphia in hysterical women if we can possibly avoid doing so. Often a habit or craving is encouraged, with all its pernicious consequences, and the symptoms of morphiomania may be developed.‡

The neurotic and lymphatic temperaments have been proved by all observers to be those most susceptible to the toxic effects of the drug. So far as its action on the catamenia is concerned, morphia used habitually has a tendency to arrest menstruation, and sterility is often a consequence. If otherwise, there are its bad effects on the embryo to be considered. One fact of the greatest importance stands out clearly in regard to morphiomania, viz. that the 'hysterical' temperament is the one occupying the foremost place in its causation. Hysteria, neurasthenia, neuralgia, cephalalgia, ovarian crises, spinal neuropathies, dysmenorrhœa, neuromimesis, are the correlated conditions, often associated with sexual disturbances, which stand in the forefront of the etiology of morphia abuse in women. And they are, unfortunately, the very conditions for which it is most frequently prescribed.

Neurotic women are distinctly those that all experience has proved are most likely to be conquered by the physiological action of the drug. They are always importunate for its employment, once they have experienced its effects, and the weak-kneed physician is compelled to yield to their importunity. A prescription is given, possibly a nurse is entrusted with the administration, and very frequently, when the nurse leaves, the patient, retaining the prescription, not only administers, but practically prescribes, the

* The disagreeable taste of the drug may be obviated by giving it in palatinoids: each contains five minims of paraldehyde. Sulphonal may be administered in the same manner.

† *Amer. Jour. Obst.*, July, 1902.

‡ At the British Gynæcological Society, March 14, 1895, the author brought the subject of the abuse of morphia in gynæcological practice forward for discussion. He then entered fully into the influence of *temperament* on its action and effects; its physiological and psychical influences, and the precautions to be observed in its exhibition.

medicament for herself. I have known a supply of two ounces of a morphia solution of the British Pharmacopœia obtained daily at different chemists', and thus as much as eighteen to twenty grains of morphia have been taken subcutaneously within the twenty-four hours.

Many of the affections of women which specially fall to the lot of the gynæcologist to treat are of a reflex nature, arising out of disorders of the uterus and its appendages, and are to be cured only by the restoration to health of the deranged pelvic organ. In the majority of such cases the morphia syringe is the most mischievous remedy to resort to. It may bridge over a period of time, but often this gain is achieved at the expense of the entire moral control of the woman, and her latent power to endure even trifling pain.

Categorically summarizing the different methods of curing the morphio-maniac or morphinises, there are—

(a) Lewistein's method of 'abrupt suppression,' or sudden stoppage of the morphia; this has been found to be dangerous, and did not answer.

(b) The plan (Erlenmeyer) of gradual suppression, or reducing the doses of morphia by degrees, and extending this over some time.

(c) The medium course of moderate suppression—or stopping the morphia gradually in the course of some eight to ten days. This plan may be combined with the use of various hypnotics. In one case of the author's urethane answered well.

(d) Alcohol has been tried as a substitute for the morphia. This has failed.

(e) Chloral also has been tried and abandoned.

(f) Opium itself has been tried, and other of its alkaloids, but they have not answered.

(g) Nitro-glycerine and other drugs have been given.

(h) Subcutaneous injections of atropine have been employed by W. Kochs, of Bonn, as an antidote to morphinism, to diminish the unpleasant results of abstinence.

(i) Heroin in combination with codeine and strychnine subcutaneously.

The treatment by moderate suppression, combined with judicious control, diet, and the use of hypnotics, is the best plan to adopt. Atropine is combined with the morphia, which is reduced gradually, while codeine is given by the mouth, and strychnine at intervals subcutaneously. There is, however, a danger in deceiving the patient by the substitution of water for morphia, as, once discovered, it is apt to lead to a sense of indignation on her part, and a refusal to be again guided by her physician.

Galvanism.—Locally, benefit may be derived from the constant current: 10 to 15 cells of Léclanché's battery may be applied daily. A pigment of iodine with belladonna or a combination of chloroform (ʒ iv.), extract of belladonna (ʒ ii.), tincture of aconite (ʒ iv.), camphor (ʒ ii.), mastich (ʒ iii.), rectified spirit (ʒ i.), laid on with a brush over both ovaries, is a most effective application, or vesication over the ovary with a little chloroform applied on a

watch-glass. But in every case of so-called 'neuralgic' dysmenorrhœa, we must seek further than the situation of the local manifestation for the cause of pain. In the intervals between the periods, the closest attention must be paid to the general management of the case; any constitutional defect has to be rectified; tonics should be given, such as quinine, arsenic, bark, minerals, acids, strychnine, nux vomica, or the salts of zinc; chalybeates if the patient be anæmic; salines and mineral aperient waters if the tendency be to plethora.

Hysteria.—The *hysterical temperament* has to be met by such remedies as the bromides, in combination with valerian, assafoetida, or galbanum. Much may be achieved by correcting errors of diet and abuse of stimulants, by attention to exercise, and by giving the mind healthful occupation with such agreeable outdoor recreation as circumstances will permit, or a course of massage with the Weir-Mitchell diet and regimen.

It is in these cases before all others, unless they be absolutely demanded by some local condition, that we should discountenance vaginal examinations, the use of the speculum, and uterine manipulations. If in the unmarried girl there be a leucorrhœal discharge during the intervals between the periods, in a large proportion of cases it will disappear with appropriate treatment, aided by the vaginal douche of hydrastis, borax, alum, sulphocarbonate of zinc, carbonate of soda, or permanganate of potash. Should it not do so, or if in the first instance, from the severity of the symptoms or their persistence, we are suspicious of local disease or abnormality, an examination should be made. I repeat that such a step is not to be unnecessarily advised or needlessly persisted in.

The same remark applies to those cases of married women, found floating about in such numbers, who have been to this doctor and that, who flippantly detail all the therapeutic means known for the cure of sterility and dysmenorrhœa, and appear to have exhausted the resources of imagination and art. The womb has been 'slit,' 'cut,' 'stretched,' 'replaced,' 'depleted,' not by one medical adviser, but by two or three; yet they are none the better, but infinitely the worse, mentally and physically, for all this ingenious exercise of manipulative skill. To restrain a woman from healthful intercourse, with proper intervals of rest, while she is made the victim of exhaustive vaginal explorations and pessary adjustments, is neither just nor reasonable. Erotic tendencies are sustained, and the whims and fancies of hysteria are encouraged.

In plethoric cases we derive benefit from salines, the various saline waters, occasional aperients, and close attention to diet and exercise. Iron has to be carefully avoided. We can cleanly, quickly, and efficiently deplete the uterus with the uterine lancet.

Digitalis, with bromide and iodide of potassium, is a useful combination, or the tincture of strophanthus may in many cases be substituted for that of digitalis with advantage. In rheumatic and gouty patients, salophen, aspirin, salol, colchisal, piperazaine (in combination with guaiacum) may be tried.

The administration of a pill containing lupuline, ergotine, extract of cannabis (of each gr. i.), taken three times daily, alternating it with a mixture of bromide of potassium and chloral, is of service. In such obstinate cases we must be particularly careful in the use of stimulants. It is far better to insist on the total relinquishment of all alcoholic drinks. If the patient cannot be induced to abandon them, we had better recommend some light wine, as claret, hock, or sauterne.

The local means of combating dysmenorrhœa will be determined according to the state of the uterus with which, on examination, we find it associated. There may be a version or flexion requiring rectification, and the application of a suitable pessary. The canal of the cervix may be contracted, necessitating dilatation of the canal with uterine bougies. We can in a few days, commencing with the bougie of 11 millimetres, increase to 30 millimetres. If the stenosis be extreme, and the cervix conical, the best course will be to prepare our patient for the division of the cervix, and to perform this operation about ten days after the menstrual period has ceased. After division, the celluloid stem may be worn for a short time (Fig. 116).

The remedies already recommended in certain forms of dysmenorrhœa associated either with amenorrhœa or menorrhagia, piscidia, hydrastine hydrochloride, cornutin, cimicifuga, viburnum, apiol, caulophillum, aletris farinosa, monobromate of camphor, are those most generally employed for the relief of the pain. They should be tried in combination. The preparations '*aletris cordial*' and that known as '*liquor sedans*' are very efficacious in subduing pain in some cases. In those which are clearly of the neuralgic type, phenacetin, '*antikamnia*,' antifebrin, ammonol, will often give relief, especially when there are also neuralgic pains in the groins and thighs. Oxalate of cerium has been given with benefit. Inflammatory states of the endometrium, should they be present, must be treated. When any polypus blocks the passage, or a uterine fibroid obstructs the flow, each has to be specially dealt with. The woman's life is often rendered miserable by these recurrent attacks of pain and intolerable suffering. When other

means have been exhausted without any benefit, we should consider the advisability of removal of the adnexa, placing fairly the exact nature and risks of the operation before our patient.

In those cases in which the pain precedes the menstrual flow, and is characteristically ovarian, with sensitiveness and fulness in the ovary at either side—a fulness which can generally be felt through the vaginal roof or rectum—depletion of the cervix or leeches applied either in the region of the ovaries or near the anus, vesication over the iliac region, warm sitz-baths, full doses of bromide of potassium or ammonium—are among the best means of obtaining relief.

The Weir-Mitchell Treatment.

Splendid results in these pitiable cases of chronic ovarian excitement, with various neurotic troubles—insomnia, loss of appetite, wasting, morbid fancies, and numerous reflex pains—may be obtained from Weir-Mitchell's plan. The principles of his treatment are: 1. Rest and seclusion of the patient. This includes the exclusion of officious, meddling, and over-sympathetic friends; the assistance of an intelligent, refined, firm and judicious nurse and companion. If there be retroversion of the uterus, the patient is kept as much as possible in the prone or face position. This rest treatment must be continued for some weeks. 2. Change of diet. This consists in feeding the patient with a light but nutritious and moderately stimulating diet, much in excess of the demand necessitated by the daily waste—principally milk at repeated intervals; soups; malt preparations (Horlick's malted milk will be found an admirable remedy); a wine, such as burgundy, hock, dry champagne; and other generous diet. 3. The administration of iron. 4. The use of massage and electricity, a skilled masseuse carrying out the massage for the space of half an hour to an hour once or twice daily. Coconut oil is employed to assist the massage. The constant-current battery is used, or a mild Faradic current applied over Ziemssen's points. Lastly, this treatment may be supplemented after a time by the use every morning of a tepid spinal douche, while the patient sits on a stool in a bath-tub with her feet in warm water. The water is poured over the back at a temperature of 80°, and is reduced one degree daily, until it is brought to the ordinary temperature. Suitable friction follows the douche, the patient dressing rapidly and after some food taking a brisk walk, which should not be of sufficient length to exhaust her strength or tire her.

In the guidance of a Weir-Mitchell case we must be influenced by the indications present in each individual patient. It is not prudent to hold hard-and-fast rules left to the discretion of a nurse in every case. Temperament, powers of assimilation, capacity to digest milk, and the effects of isolation, have to be regulated for each.

'The patient should be weighed before being put to bed, and at frequent intervals during the treatment. She is first placed on a milk diet, and for the first day or two from three to four ounces are given every two hours. The milk may be slightly warmed, and, if it be particularly distasteful to the

patient, may be flavoured with a little tea or coffee. The quantity is gradually increased, and the intervals lengthened to three hours, till at last two quarts are taken in the twenty-four hours. This rest in bed, and the simple milk diet, "nearly always dismiss," says Weir-Mitchell, "as if by magic, all the dyspeptic conditions" from which the patient had previously suffered. The circulation is at the same time stimulated, and the muscles undergo passive exercise by being kneaded by massage and moved by electric currents. The bowels are carefully regulated. After from four to seven days, a little solid food is taken, namely, bread and butter for breakfast, and a milk pudding for dinner. A day or two later, fish and chicken or a mutton chop are added, first either to the mid-day or evening meal, and then at both. In about ten days the patient is put on three full meals daily, and the diet is as follows:—

'Milk—sixty to eighty ounces.

'Breakfast—porridge and cream.

'Second breakfast—cocoa and egg, bread and butter.

'Luncheon—fish, bread, pudding, and milk, or chicken, vegetables and pudding.

'Dinner—mutton or other digestible meat, two or three kinds of vegetables, milk pudding, or stewed fruit with cream.

'Extract of malt may be given with one or more of the supplies of milk, and in some cases cod-liver oil is also prescribed.' *

Membranous Dysmenorrhœa.

This is not a common affection. Here we have exfoliation of the uterine mucous membrane, either in the form of shreds, or sometimes as a complete cast of the uterine cavity in which are the orifices of the Fallopian tubes or os uteri. A patient of the author's before marriage passed these casts of the uterus, and this continued for the first year after marriage. The little membranous exfoliation preserved completely the form of the uterine cavity. The affection yielded in time to treatment; she became pregnant and had a family. This form of dysmenorrhœa is not necessarily related to conception. It does not of necessity cause sterility, though as long as the affection persists it predisposes to this condition. Microscopically, the membranous layer is found to be composed of connective-tissue, glands, and deciduous cells.

In two cases reported by Mansell-Moullin, the structure of the membrane was shown to consist of 'large fusiform and rounded cells, many of which appeared to have two nuclei, as if undergoing proliferation, containing utricular glands lined with columnar epithelium of large size, and numerous blood-vessels of different calibre.'

The passage of the membrane is not always accompanied by pain. There is frequently associated with the dysmenorrhœa endometritis. We must not confound this membranous cast with an exfoliation or a blood-coagulum. The microscope and a little care will prevent this error. Hitherto neither the abortive evolution theory, nor any

* Mrs. Ernest Hart, 'Diet in Sickness and Health.'

other, has satisfactorily explained the causation of this affection. If we hope to alter the character of the menstrual act radically, we must change the nature of the uterine mucous membrane. The most energetic treatment consists of dilatation of the uterus, the use of the curette, and the subsequent application of chromic acid to the endometrium. Inflammatory complications should be subdued if they exist. The interior of the uterus should be treated during the intervals between the periods by such remedies as fused nitrate of silver or sulphate of zinc points, iodized phenol, ichthyol, or carbolic acid. If the pain be severe during the separation of the membrane, chloral and bromides, opiate suppositories, vaginal pessaries of belladonna and morphia, or morphia injected subcutaneously, will give relief. Coitus should not be allowed while the patient is under treatment.

Electrolysis in Dysmenorrhœa.—Dilatation by electrolysis has answered well in several reported cases. The positive rheophore is placed over the abdomen, and the negative electrode is introduced into the uterus through the internal os. The sitting lasts from ten to twenty minutes. Six small Leclanché cells are used.

Menorrhagia.

In dealing with any case of excessive flow of blood from the uterus some broad practical rules have to be remembered.

1. Never neglect nor trifle with an unusual, continuous, or exaggerated loss of blood from the uterus, by palliative measures.
2. Always remember that the hæmorrhage is but the sign of some abnormal condition elsewhere, or of disease in the uterus itself.
3. *In case of doubt make a careful vaginal examination ; should this not explain the cause, and the hæmorrhage continue, dilate the uterus and explore its cavity.*
4. Once the cervix is dilated, maintain a certain degree of dilatation, as long as the discharge of blood continues.

The local conditions most frequently met with which cause hæmorrhage are : fibroid tumours, subinvolution, endometritis and cervicitis, morbid conditions of the endometrium, products of conception in utero, erosion of the external os and cervix, granular states, malignant disease, polypus, and uterine congestion associated with flexion, and ovarian congestion.

Our treatment may be divided under two heads : (1) Attention

to any organic disease in the heart, lungs, liver, spleen, kidney ; the control of excessive discharge during the exanthemata, in purpuric states, at the climacteric period, or after prolonged lactation. (2) The removal of the local cause by operation or other local treatment.

In dealing with the excessive bleeding which is associated with some disorder of menstruation it will here suffice to enumerate the most efficacious uterine hæmostatics and astringents we possess.

1. **Heat.**—By the vaginal douche and water at 115° to 120° .

The glass, or other reservoir filled with water at the required temperature, is hung on a nail (or placed on a wardrobe) about 8 feet high. The patient (or her nurse) inserts the tube, directing it backwards into the vagina, and by turning the cock the water flows. The can ought to be sufficiently large to contain 2 quarts. It is preferable to have the assistance of an attendant or nurse. Tincture of iodine, Kreuznach liquor, Woodhall Spa water, boric acid, bicarbonate of soda, borax, Condyl's fluid, liquid extract of hydrastis, may be added to the water.

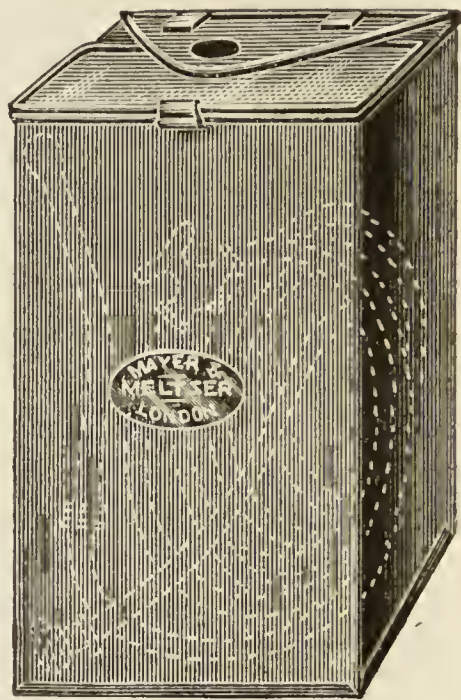


FIG. 157. — USEFUL AND PORTABLE CAN DOUCHE IN WHICH THE TUBE, PIPE, AND THERMOMETER ARE PACKED FOR TRAVELLING.

Others can be had with the temperature and water-gauges attached.

Misuse of the Hot Douche.—I think the admonition of W. Goodell, with regard to the hot douche, contained in his paper on 'What I have learned to unlearn,' of the greatest importance, and it is one in which I fully concur.*

'My experience teaches me that, save in some cases of active congestion or of acute inflammation of the pelvic organs, the hot douche is of questionable utility, and that its indiscriminate employment has done far more harm than good, especially when continued for any length of time. I cannot withhold the opinion that from its use ovaritis, salpingitis, and peri-uterine inflammation have actually been set up by the over-heating and the subsequent chilling of the pelvic organs. The crucial test of surgical research, which cannot be gainsaid, has shown that cellulitis is almost a myth, and that what have been deemed exudation tumours and inflammatory deposits in the areolar tissue, are tubal and ovarian lesions.'

It is quite true that the use of the hot douche degenerated into an abuse, and that mischievous effects were frequently caused by a remedy which was ordered indiscriminately for every form of pelvic disease that manifested itself by a hæmorrhagic discharge.

* *Provincial Medical Journal*, vol. x., p. 243.

2. **Cold.**—Vaginal douche ; ice-bag in vagina ; irrigating tube in vagina ; ice-bag or bladder over pubes. Cold is always to be used with caution where there is great debility or tendency to collapse. Leiter's tubes may also be placed over the uterus.

3. **Tampon.**—This may be applied in the form of a sterilized sponge-tent inserted into the cervix—the sponge acts both as a dilator and plug.

Vaginal Tampon or Plug.

In cases of hæmorrhage we can make a convenient and efficient plug thus : A roll of aseptic wool is tied in the centre with a string, and spread out umbrella-shape ; several small pieces of wool are at hand. Moisten the surface of the wool with a little perchloride or the subsulphate of iron solution, hazeline, hydrastis, glycerine and carbolic acid, glycerine of tannin, or glycerine and permanganate of potash solution. A Sims' speculum is introduced. The medicated wool with the string attached is now pressed home against the os—it is better to first dry the part thoroughly—and following it the smaller pieces of wool are pushed in, until the upper part of the vagina is well filled. Always remove such a plug after twelve hours. If we want more securely to fill the vagina, we may use strips of lint, chinosol, or iodoform, in the form of a 'kite's tail.' The lint may be moistened with lysoform 1 in 1000, carbolized water, perchloride of mercury (1 in 10,000), or permanganate of potash solution.

The strings attached to the rolls should be numerically knotted as they are inserted, so as to distinguish them in removal.

If the object be first to fill the space of Douglas, the better plan is to place the woman in the knee-elbow position and fill the posterior cul-de-sac with several small tampons, moistened with a disinfectant.

Two rules are to be always borne in mind in regard to plugging ; (a) Never look upon it save as a temporary expedient for the control of hæmorrhage ; (b) never permit a plug to remain for a longer period than twenty-four hours at the outside in the vaginal cavity, and always disinfect and cleanse the vagina after its removal and before a second is inserted.

4. **Local Astringents.**—The interior of the uterus may be wiped out with solutions of any of these agents : alum, in tampon or injection ; persalts of iron, perchloride of iron, either as the liquor, or, what is far preferable, the solution in water of the solid salt, made any strength (grs. xxx. ad. $\bar{3}$ i.) ; sulphate of iron solution ($\bar{3}$ ss. ad $\bar{3}$ i., Sims) ; ferro-alumen ; gallic acid ; tannic acid ; matico in injection ; hamamelis, adrenalin or renaglandin. Vaginal tampons of glycerine, and liquid extract of hydrastis with tincture of matico, are very efficacious.

5. The more powerful internal *therapeutic remedies* are ergot ; ergotine, or sclerotic acid, given subcutaneously ; ergotine, with lupuline and quinine, given in pill ; tincture of perchloride of iron : infusion of matico, alone or in combination with perchloride of iron, gallic acid, tincture of digitalis, or extract of hamamelis ; digitalis, in combination with ergotine ; dried sulphate of iron and quinine ; gallic acid (gr. xx. doses), with infusion of matico and liquid extract of ergot, or the ammoniated solution of ergot ; ergole ; quinine, with aromatic sulphuric acid or dilute sulphuric acid ; aletris ; viburnum ; hydrastis.

Hydrastine Hydrochloride (Hydrastia).

The clinical indications for the employment of hydrastia are to be found especially in those various atonic vascular states of the uterus, occurring at any period of active menstrual life, some of which are attended by excessive loss of blood, either of the menorrhagic or metrorrhagic type. It is also of benefit in those cases of congestive dysmenorrhœa in which we frequently find the severest degree of menstrual pain, though the loss of blood is excessive. My experience quite confirms that of Goth,* that it is especially in hæmorrhages of the menopause, provided there be no organic changes in the uterine tissues, nor intra-uterine growths present, that the value of hydrastia is best seen. I speak more particularly of its internal use. I combine with the hydrastia such remedies as ergot, or ergotine, sclerotic acid, cannabin, digitalis. It is with a view to the administration of these drugs in a convenient form that I have had palatinoids prepared. Hydrastia and sclerotic acid will be found most useful in vicarious hæmoptysis or epistaxis (in the latter the extract may be used with glycerine and tincture of matico most efficaciously as a local styptic, or on a tampon). In chronic hyperplastic conditions, in the earlier stages of uterine subinvolution, in the 'secondary hæmorrhages' (McClintock) that follow abortion, miscarriage, or labour, hydrastia in combination with other astringents will be found valuable, both administered internally and applied locally. I have many times tried both the tincture, extract, and alkaloid in various forms of myomata. The results have been generally disappointing. There have been some modification and partial control of the bleeding occasionally, but no permanent or marked relief. The alkaloid *hydrastinine* may also be given.

Stypticine as a Uterine Hæmostatic.—I frequently use stypticine with hydrastia in the treatment of uterine hæmorrhage. It is one of the oxidation products of narcotine. The dose of stypticine is 0·05 gramme, four or five times in the day. It combines a sedative with its styptic action. Goltschalk uses it as an adjuvant to the curette. It must be remembered that it is an excitor of uterine action, and hence is contra-indicated in threatened abortion. It is a powerful vaso-constrictor. The hæmorrhages in which it proves of most service are those due to uterine interstitial fibroid, and in menorrhagia

* *Lancet*, February, 1887.

due to subinvolution. I have had it combined in the palatinoid form with ergotine, hydrastia, and cannabin tannate. Thus—

Hydrastia, gr. $\frac{1}{2}$.

Ergotin, gr. $\frac{3}{4}$.

Cannabin tannat, gr. $\frac{1}{2}$.

Stypticin, gr. $\frac{1}{4}$. M.

Also—

Ext. viburni, grs. ii.

Ext. hydrastis, grs. ii.

Ext. piscidiæ erythinæ, gr. i. M.

Vascular Tonics and Hæmostatics.—In those cases of atonic dyspepsia and general debility, so commonly met with in women who have suffered from menorrhagia from any cause, especially those who have lived in the tropics, if there be cardiac weakness accompanying the dyspeptic state or loss of appetite, *the vascular tonics, digitalis, convallaria, and strophanthus*, in combination with a uterine hæmostatic, are indicated.

In my first contribution to periodical literature, I urged the therapeutic value of digitalis in uterine hæmorrhage as indicated by its physiological action on the arterioles. In such cases as those just alluded to, in which we find ventricular incompetence, this drug acts well with hydrastis when the system is generally enfeebled by repeated, erratic, and excessive loss of blood. The value of strophanthus in dysmenorrhœa has been pointed out by different gynæcological authorities, and its use in cardiac incompetence is established. The uterine hæmorrhage which is associated with aortic disease is most troublesome to treat. Here strophanthus is specially indicated. It has the disadvantage, as compared with digitalis, that we are not so certain of its action in causing contraction of the arterioles, and its effects are not of so permanent a nature. But in those cases of menorrhagia and metrorrhagia associated with cardiac, functional, or organic lesions, occasionally attended by dysmenorrhœa, the administration of hydrastis and strophanthus will be found of great service, and there is no objection to the addition of ergot. Strophanthus in such cases has this advantage over digitalis, that it is better tolerated when administered for any length of time. Hydrastis is a valuable adjunct to the uterine tonics, aletris farinosa, in combination with 'celerina' and aletris cordial, and I have frequently given these drugs in palatinoids, with great benefit. 'Celerina' (celery, coca, kola, viburnum, grs. v.— ʒi.) is a good tonic for women who have suffered from uterine losses. The local use of hydrastis in uterine affections is as important as its internal administration. The fluid extract is the preparation most suitable for topical use. In cases of chronic endometritis, in cervical erosions, and after scarification of the cervix for congestive states of the uterine cervix, the fluid extract combined with ichthyol solution (20 per cent.), carbolic acid or iodine, adding equal parts of glycerine, is an admirable remedy.

As a cervical dressing it will be found of service applied on the vaginal

tampon, either alone or with one of the above-named additions. The tampon, first soaked in glycerine and shaped, has the fluid extract or some of the compound preparation poured on the surface, and is easily applied at night by the patient herself. A patient should be taught how to apply a tampon properly. In many instances it might as well be left on the toilet-table. In cases where the use of the hot douche (110° to 120°) is called for, the liquid extract of *hydrastis* (3ii.—3iv.) may with benefit be added to the water contained in the quart can.

The general management of the patient suffering from menorrhagia will depend on the constitutional state on which the hæmorrhage is attendant. General or ovarian excitement may be controlled by bromides. In atonic states, strychnine, in combination with quinine and iron, is indicated. If the debility induce hysteria, valerian (ammoniated tincture and infusion) is an admirable addition to the bromide preparations. In plethoric conditions, at the time of the menopause, and if there be any hepatic congestion, saline purgatives, bitter waters, vegetable cholagogues (podophyllin, iridin, euonymin), alternated occasionally with a mild mercurial, as a few grains of calomel or grey powder, should be given. If loss of blood should have induced an anæmic or chlorotic state, iron should be judiciously administered in any of the forms already mentioned, the dialyzed preparation of Squire, Fellows', Easton's, or Dusart's syrups, Flitwick iron water, hæmoglobin, Bland's pills, the perchloride tincture, and the chloroxide, being excellent forms to administer it in.* Hæmoglobin troches I have had made in the form of syrup to avoid the unpleasant taste of the drug.

Operative Interference.

With regard to the operative treatment of menorrhagia, there are such minor interferences as depletion, dilatation, section of the cervix, and the operations of Sims and Dudley, all of which have their special indications, and are relatively valuable according to the congenital or pathological condition present, in the treatment both of dysmenorrhœa and menorrhagia. Already I have referred to dilatation and exploration. Dismissing these, there are a few important principles to bear in mind when dealing with dysmenorrhœa, arising from pathological states of the uterus and adnexa. In the uterus we have most frequently to deal with displacements,

* For reference to the treatment of menorrhagia by electricity, see remarks on Gynæcological Electro-Therapeutics, as also on zestocausis and atmocausis.

hyperplasia, chronic endometritis, interstitial myomata, and intra-uterine fibroma. With regard to displacements, while I do not agree with those who say that the days of all pessaries are numbered, I believe that the time is rapidly approaching when the radical cure, by Alexander's method, or by ventro-suspension, will be the rule, and the wearing of an internal support the exception, in all cases of retroversion in which reposition is difficult and recurrence of the malposition inevitable without an artificial prop. *A pessary in anteversion or anteflexion is generally mischievous.* Possibly Galabin's is the least so. In many cases there will be found an intramural myoma in the anterior wall of the uterus which demands enucleation. Endometritis, whether hyperplastic, catarrhal, hæmorrhagic, or gonorrhœal, requires thorough and efficient curettage, and subsequent following up of the operation by efficient treatment until complete cure has been effected. Small intramural myomata, which are often multiple, and encroach on the uterine canal, may be enucleated by colpotomy. Intra-uterine fibromata, which often escape detection, causing both dysmenorrhœa and menorrhagia, are as a rule easily removable after dilatation, by écraseur or polystome. It is not pleasant to find, after removal of the adnexa for incurable dysmenorrhœa, that all the time it was due to an intra-uterine polypus.

With regard to the adnexa, whether the morbid condition be in the Fallopian tube or ovary, the justification for interference must entirely depend upon the clinical symptoms and signs, the duration and the urgency of the case. Obvious and gross changes in the female genitalia, as elsewhere in the body, should be dealt with on broad general principles. Useless and diseased parts should be removed, useful and healthy portions of organs preserved, and, with the comparatively slight risks involved in the modern operations both of colpotomy and laparotomy, especially the former, there is no surgical excuse for procrastination in dealing with conditions that may sooner or later destroy not only an organ but a life.

CHAPTER IX.

UTERINE NEUROSES AND REFLEXES.*

A FEW observations on the subject of uterine reflexes may not be out of place now that we have considered those conditions which are mainly associated with such reflex disturbances.

The connections between the vagina, uterus, and ovaries, through their nervous supplies, with the splanchnic nerves, and with the spinal cord in the sacral and lumbar regions, through the pelvic and hypogastric plexuses, anatomically explain many of the reflex phenomena that follow upon stimulation or irritation of the ovarian and uterine nerves consequent upon disease in the ovaries or uterus.

The reflex connection between the mammary gland and the uterus, and between the latter and the sciatic nerve, shows that this reflex association is established between the uterus and such a distant part as the nipple, and with peripheral nerve-trunks, as those of the sciatic. And in whatever light we look upon ovulation, or the part played in it by the uterus and Fallopian tubes, and the various physiological effects brought about by it on the entire being of the woman, the consequences which follow a deviation or interruption of that process are but constantly recurring demonstrations of the physiological effects produced under its influence in almost every organ in her body. (This influence has been fully discussed in dealing with disorders of menstruation.)

As examples of this, we may take the occurrence of varying shades of optic neuritis and retinal irritation in connection with suppression or irregularity of the catamenia; neuralgic pains in the eyeball associated with the menstrual epoch, neuralgia of the supra- and infra-orbital nerves, slight epileptiform seizures of the facial muscles, toothache and dental neuralgia, laryngeal migraine and

* The greater part of this chapter was written many years since, and has undergone but little alteration in successive editions of the work. Since then, the subject has been widely discussed by British, American, and foreign gynaecologists. This and the following chapter have a close relation to each other.

functional aphonia, or paresis of the intra-laryngeal muscles, milder forms of hypertrophic rhinitis, and similarly, tinnitus aurium and vertigo, sympathetic neuralgia and temporary congestion of the mamma. As consequences of menstrual irregularities, we find irritation of the dorsal and lumbar painful spinal zones, herpetic eruptions of the skin, functional irregularity of the cardiac rhythm, gastralgia and nausea, slight icteric attacks, atonic or irritable states of the intestines, irritation of the bladder, with increased frequency of micturition, pains in the branches of the lumbar and sacral nerves; varieties of headache, and severe hemicrania. All such symptoms may be accounted for by reflex vaso-dilating or vaso-contracting effects produced by irritation arising in the uterus or ovaries, as the result of arrested or imperfectly discharged physiological processes.

The ready response of the uterus to such stimuli as an anæmic blood current, or one in which there is an excess of carbonic acid, is an established physiological fact, and the influence of such reflex impressions as are conveyed by a cold hand on the abdomen, or friction of the mammary gland, has been obstetrically availed of from early times. How readily its catamenial functions are disturbed by such causes as mental or physical shock, cold and heat, we are all familiar with. So it must happen that an organ so susceptible to any direct or reflected stimuli will, in the many varying states of a woman's health, or the incidental occurrences of her daily life, respond quickly to these influences. The physiological pain, and the much-debated 'spasm' of dysmenorrhœa, having no apparent cause in ovary or uterus are readily accounted for by an anæmic or toxæmic blood-supply, resulting in those contractions or 'spasms' that attend on the 'obstructive' form of dysmenorrhœa. It undoubtedly is true, as insisted on by Clifford Allbutt, that the ill-health of the woman is the cause of the ill-health of the uterus in many cases. It is equally true that the ill-health of the uterus or ovary is frequently the first step in the general deteriorating process, which, as it originates, so it maintains. All we know of the physiology of uterine action compels us to regard the uterus and ovaries as the strongest links in the chain of the woman's health of mind and body. Weaken them as you may from without or within, and you immediately, but fundamentally, touch all the mainsprings of her life.

All these functional disturbances I have from time to time seen and treated, where the association with disorders of menstruation was clearly to be traced. And if this be so in the instance of

aberrant *physiological* functions, how much more likely are we to have such consequences following gross *pathological changes* in the uterus and appendages. And this we find to be practically the case.

In prolonged disorders of the uterus, resulting in enlargement, hyperplastic deposits, or a process of fibrosis following on arrested involution, in those secondary pathological conditions attending upon lacerations of the cervix, in deep erosions, in unrelieved versions and flexions, in tubal enlargements and displacements, and in chronic affections of the ovary, as sequelæ of pregnancy, we find not only these reflexes present, but more aggravated pathological consequences and more serious disturbances of function. We have this association exemplified in the eye in thrombosis or embolism, in retinal infarctions or extravasations with their secondary consequences—atrophy and partial or complete loss of vision; in the nose, in epistaxis, chronic nasal catarrhal states and perversions of smell; in the ear, in labyrinthic apoplexy, with all the symptoms characteristic of Ménière's disease, vertigo and deafness. We see the same consequences in the brain, in hallucinations of smell and taste, illusions and delusions, from slight erraticisms in mental action to complete perversion of the mental faculties, as in climacteric mania: in the nervous system generally, in such evidences of instability as aggravated hysteria, neuralgia, hystero-epilepsy, and epilepsy. In the skin these manifestations are shown in such nerve disturbances as prurigo and herpes, or in the appearance of acne or eczema. The occurrence of "nervous" alopecia, and the aggravation periodically of any chronic disorder—as, for instance, psoriasis and erythematous lupus—are not infrequent results of menstrual disorders. I have already referred to menstrual ulcer and pigmentary changes. In the heart, irritability in action and hæmic murmurs—conditions which frequently lead to a permanent hypertrophic state, or are felt through attacks of syncope, with evidences of low vascular tension generally, as shown by an habitually compressible pulse—are common.

We meet in the stomach with gastric irritation, with possible congestive changes which may lead up to gastric ulcer. There are atonic states of the bowel which tend to constipation on the one hand, or on the other to diarrhœa, while disordered sexual function and perimetric inflammation frequently lead to congested conditions of the rectum, complicate hæmorrhoids, and are apt to produce that irritability of the sphincters so conducive to costiveness.

The important bearing of uterine affections on diseases of the rectum, and on operative interference for these, in preventing, as

long as they are unrelieved, a successful issue from the latter, is well known to any one who has had experience in rectal affections. Hence, in a great number of cases, the necessity imposed of delaying operation until the uterine affection has been rectified.

Apart from these more direct consequences of pelvic visceral disease, there are those indirect results that follow upon interference generally with metabolic changes in the various viscera, consequent upon abnormal states of the circulatory fluid, and in which defective ovarian or uterine functions react on such states as anæmia and chloræmia, thus altering the normal secreting functions of the liver and kidneys, and seriously interfering with the metabolic action of the spleen.

Whether such conditions are primary or secondary to the general state of health, dependent upon these interruptions, matters little to us as practical physicians. So long as we recognize the physiological game of battledore and shuttlecock that they play in deteriorating the health in the individual, we are bound to recognize and treat them.

The Neurotic Temperament.—It is cruel to a woman to style her ‘neurotic,’ ‘hysterical,’ or ‘hypochondriacal,’ while she suffers from any disease of her pelvic viscera, which does thus accentuate or aggravate the ordinary consequences that attend upon any abnormal constitutional condition. It is something more than injustice to her if we deliberately and complacently ignore the influence that such local disease exerts in exciting morbid impulses in her central nervous system. This danger is none the less because temperament in a woman plays so prominent a part in the predisposition to disease and the susceptibility to pain. We must be careful, however, to keep the neurosis associated with disease quite distinct from that which is the outcome of temperament, disposition, and habits.

There is a large class of sufferers from affections of the female generative organs which is commonly spoken of as ‘nervous.’ The neurotic woman is to be regarded in the light of a by-product of that unstable nervous organization which we style the ‘nervous temperament,’ and it were well to confine our employment of this term ‘neurotic’ to such abnormal and morbid exaggerations of this temperament as are not uncommonly found associated with pathological conditions of the woman’s pelvic viscera. Thus, we can frequently trace the incipency of the neurosis to the occurrence of some accident or injury, which may have had a dual consequence through the infliction of shock, or the displacement or affection of any one of these organs. Previous to such accidental determinations, the woman may have been normal in the control of her will, feelings, and emotions. Her energy and impulses have directed her actions, without causing that sense of reaction and fatigue which is so constantly present after slight exertion when her impulses are diverted by unhealthy excitations, and her energy is dissipated by morbid introspections. Such a nervous temperament is frequently satisfied with little sleep. Under the influence of excitement, fatigue is quickly

recovered from, and a latent reserve force of energy appears ever ready on demand to carry its possessor over insurmountable obstacles. All this accumulated governmental control of will and nerve energy are missing in the neurotic, but none the less is that loss felt when the unequal struggle occurs between the sovereignty of an enfeebled indeterminate will and the rebellious and more masterful emissaries, the woman's 'lower passions and lower pains.' While in health, such individuals can pass through great physical and mental exertion without stimulants, but when the natural call on their reserve energy finds no response, they apply the artificial spur of alcohol or some other excitant, as morphia, to the flagging nerve-cells. Such women are quite cognizant of the abeyance of the power to exercise free will. The desire to suppress the expression of pain is present, but the usual control is lost. Also, there is general hyperæsthesia of the peripheral nerves, which find in the frequently ill-nourished cells a susceptibility to slight impulses and morbid sensitiveness, with an exaggerated perception of comparatively trifling stimulation. Here we are dealing with an acquired neurosis, for which possibly we may find no clue through atavistic transmission. On the other hand, we can frequently see in early childhood the traits of temperament which clearly foretell the future neurotic woman. Capriciousness, irritability, selfishness, restlessness, and excitability, are among the mental characteristics which stamp the moral prototype in the child of the adult neurasthenic and hysterical woman, though it is after puberty that we frequently find such distinctive features of character develop themselves. When a woman of this type marries, in the demands on her nervous system, if she be not sterile, which the claims of children and domestic duties involve her in, she generally escapes those neurotic and hysterical manifestations that are found in the unmarried and sterile. In the single woman of the 'neurotic' type, we are most likely to meet with those erotic thoughts, desires, and practices that still further enervate her nervous system and enfeeble her central control.

Turn we now for a moment to the *lymphatic* antithesis of this unfortunate victim to morbid nerves and sexual impulses.

The Lymphatic Temperament.—There is a type of woman, familiar to us all, indolent, lethargic, fanciful of ailments, with a superficiality bordering on childishness in conversation, dull of comprehension, readily open to flattery, even to her own self a bore, and frequently one to her husband and children if she be married. She is often found fringed with layers of pectoral and abdominal fat, the easy prey to quack systems of dieting, and to the 'man of the world' physician. Her defective metabolism, added to a sexual voluptuousness, makes her the registered dual property of the 'pure specialist' for gout on the one hand, and the cotton-wool gynæcologist on the other. She is one of the principal sources of revenue to the Franc Tireurs of the outposts of medicine—the ubiquitous masseurs or masseuses—as the previously described sufferer is to the fashionable 'Weir Mitchell Home.' With her, every twinge is 'agonizing,' to walk is impossible, and once let her evolve 'uterus and ovary on the brain,' and, whether these organs be diseased or not, they are made responsible for every ill her peccant flesh is heir to. She is not of the classical neurotic type previously described, though her visceral neuroses may in time come to be legion. She may suffer from congestive dysmenorrhœa and

ovaralgia, her uterus may be as flabby as her brain, and her ovary be as fertile in aches as her imagination is in fanciful illusions. Her voluptuosity is not limited to her appetites of palate, and it is not infrequently manifested in various sexual abuses. She fancies that she sleeps for many hours less than she actually does, and hence is often seeking for some new hypnotic. While we find in the unmarried more frequent examples of the first type of temperament, married women furnish a larger proportion of the latter.

In two hundred and seventy cases of disease and abnormal conditions of the sexual organs in women, selecting those cases in which no special functional or organic troubles in any other organ were more particularly complained of, from a total of some five hundred, I give a brief analysis of the associated mischiefs which, in the vast majority of the cases quoted, were secondary to the affections of the sexual organs. Cases are not included in which there were grosser changes, such as large fibroids and ovarian cystoma. The comparative ages of these patients are roughly shown in this table :

	Cases.
Under 20	7
20—30	90
30—40	102
40—50	63
50—53	8
	—
	270

195 married ; 75 single.

The principal abnormal state present in each case was:—

	Cases.
Retroversion, with or without flexion	55
Marked anteversion, with flexion	11
Ovarian enlargement, with or without tubal affection	23
Retroversion, with ovarian and tubal complications	11
Subinvolution of uterus	33
Erosion of cervix, with or without endocervicitis	22
Hypertrophic condition of uterus	6
Hypertrophic condition of uterus, with ovarian complications	9
Endometritis, with or without ovarian complications	14
Extensive laceration of cervix	6
Stenosis, with congenital malformation	15
Small fibroid tumours	11
Intra-uterine polypus	2
Sarcoma of uterus	1
Symptoms incidental to menopause	29
A direct sequel to pregnancy	1
Suppression of catamenia	18
Vaginismus	1
Absent perineum	2
	—
Total	270

Of the entire number quoted, fourteen were not submitted to local examination, and are included under the head of 'Suppression of catamenia.'

We turn now to the symptoms other than uterine or ovarian complained of in the two hundred and seventy cases.

No case of malignant disease is included save one of sarcoma.

The following are the principal signs and symptoms complained of by the two hundred and seventy patients:—

	Cases.
Anæmia	19
Skin affections (as eczema, erythema, acne, erythematous lupus, alopecia, psoriasis, prurigo)	13
Head symptoms (as aggravated headache, 'fulness in the head,' loss of memory)	53
Facial neuralgia	15
Neurasthenia	45
Migraine	16
Mammary sympathies (as neuralgic pains, glandular changes)	6
Spinal pain and irritation	10
Intercostal neuralgia	25
Numbness of upper extremities	4
Numbness of lower extremities	4
Pain in upper extremities	2
Pain in lower extremities	9
Stiffness in ankles with each period	1
Catalepsy	2
Hysteria	13
Insomnia	15
Epilepsy	3
Tendency to melancholia, depression	9
Dementia	4
Agorophobia	1
Ophthalmic symptoms dependent upon abnormal retinal states (as optic neuritis, pathological changes in papilla, hyperæmia of retina, asthenopia)	15
Nasal symptoms due to turbinate congestion or hypertrophy .	5
Laryngeal symptoms, such as varying degrees of aphonia due to paresis of laryngeal muscles, hyperæmia of vocal cords .	12
Œsophageal spasm	1
Thyroid enlargement	1
Tinnitus aurium	7
Sickness and nausea	5
Gastralgia	15
Dyspepsia	11
Cardiac symptoms (as irregularity of rhythm, intermission, dyspnœa, hæmic bruit)	33
Attacks simulating angina pectoris	1
Abdominal symptoms (as erratic pains, flatus, hepatic engorgement, dysenteric symptoms, diarrhœa)	17

	Cases.
Aggravated constipation	11
Pain and irritability of rectum	4
Vesical symptoms (as irritation, difficulty of retention or pain with micturition, vesical pain)	30
Difficulty of locomotion	24
Impairment of general health	54
Painful sitting	1
Epistaxis	2
Defective circulation—lividity of upper and lower extremities	2

Under the heading of 'aggravated headache' should be frequently included symptoms such as those described as 'fulness in head,' 'pressure on head,' 'sense of tightness,' and 'flushings.*' Under that of neurasthenia are included those well-known unstable states of the nervous system generally, which embrace various morbid apprehensions, fits of depression, uncertainties of sight and touch, disturbance of sleep, irritability or capriciousness of temper.

Under 'difficulty of locomotion' are only reckoned those cases in which there was a decided inability to walk. 'Impairment of general health' includes such general conditions as 'lassitude,' feeble circulation,' 'weak cardiac action,' 'alteration in the specific gravity of urine,' 'tendency to syncope,' 'loss of appetite,' and proofs in the complexion and facial expression of great enfeeblement of the system. The throat and skin have likewise their reflex relationships with the organs of generation in women. The slight elevation of temperature in the skin during the catamenial period is a physiological fact worth remembering.

Such evidence has convinced me that many distant lesions and remote symptoms are due to, and have their exciting cause in, uterine irritation.

The alternating and dominating influence exerted by body and mind over each other in maintaining or disturbing that healthful harmony essential to the preservation of a normal balance of power betwixt the two, is, in my opinion, nowhere better exhibited in the organism than by the effects produced in the nervous system of a woman by the ordinary physiological variations in the health of her sexual organs. How far that harmony is influenced by functional or pathological deviations from a healthy state of these organs, is shown clearly by the list of nervous affections just cited.

While thus insisting on the part played by the sexual organs of women in the causation of reflex neuroses, visceral, and other, the weighty words of Goodell should be kept in mind :—

Mimicry of Uterine Affections.*—'I have learned,' he says, 'to unlearn the idea that uterine symptoms are always present in cases of uterine disease, or that, when present, they necessarily come from the uterine disease. The

* See remarks on Eye Strain, Chapter III.

nerves are mighty mimics, the greatest of mimics, and cheat us by their realistic personations of organic disease, and especially of uterine disease. Hence it is that seemingly urgent uterine symptoms may be merely nerve-counterfeits of uterine disease. I have, therefore, long since given up the belief, which with many amounts to a creed, that the womb is at the bottom of nearly every female ailment.

‘Nerve-strain, or nerve-exhaustion, comes largely from the frets, the griefs, the worries, the cares and cares of life. Yet although the imagination undoubtedly affects it, it is not a mere whim or an imaginary disease, as all healthy women and most physicians think; but it is the veriest of realities. When some flippant talker or some slipshod thinker scoffs at nervousness as a sham disorder, I say to him: “Can the bribe of a principality keep you from blushing when you are ashamed, or from blanching when you are afraid?” Under the fitting sense of shame or fear, these vaso-motor disturbances are momentarily beyond your control; and so they are in the nervous woman, whose vital organs are, as it were—not transiently, but—perpetually blushing and blanching under deficient brain-control over the lower nerve-centres.’

‘Strangely enough, the most common symptoms of nerve-disorder in women are the very ones which lay tradition and empiricism attribute to womb-disease. They are, in the order of their frequency, great weariness, and more or less of nervousness and wakefulness; inability to walk any distance, and a bearing-down feeling; headache, napeache, and backache; scant, painful, delayed, or suppressed menstruation; cold feet, and an irritable bladder; general spinal and pelvic soreness, and pain in one ovary (usually the left), or in both ovaries. The sense of exhaustion is a remarkable one; the woman is always tired; she passes the day tired, she goes to bed tired, and she wakes up tired—often, indeed, more tired than when she fell asleep.

‘Now, let a nervous woman with some of the foregoing group of symptoms recount them to a female friend, and she will be told that she has a womb-disease. Let her consult a physician, and ten to one he will think the same thing, and diligently hunt for some uterine lesion. If one be found, no matter how trifling, he will attach to it undue importance, and treat it heroically as the peccant organ. If no visible disease of the sexual organs be discoverable, he will lay the blame on the invisible endometrium or on the unseeable ovaries, and continue the local treatment. In any event, whatever the inlook or the outlook, a local treatment is bound to be the issue.’

CHAPTER X.

AFFECTIONS OF THE FEMALE GENITALIA AND THEIR SPECIAL BEARING ON THE OPERATIVE TREATMENT OF THE INSANE.*

Physiological and Psychopathic Considerations.

IT is an easy task to show that intimately associated with certain problems in psychiatrics are others which require for their elucidation the observation and research of the gynæcologist. For this purpose we have to go no further than the psycho-physical, psycho-physiological, and psycho-pathological phenomena attendant upon the act of ovulation and its expression in the menstrual discharge, as they are made manifest, not only during abnormal, but also in normal, menstruation. Also, interferences in any part of the cycle of metabolic phenomena, which, combined, constitute a complete menstrual period, have so often correlated with such disturbances varying shades of disordered mentalization, from the slight and almost imperceptible deviation from health, to those more pronounced interruptions of the mental equilibrium which bring us to the borderland of insanity, if not to the ideas, impulses, and actions of the completely disordered mind. Such psychical and psychopathic associations or sequences have their anatomico-physiological explanation, through the various lymphatic, vascular, and nervous supplies and distributions of the sexual organs involved in the process of ovulation. We have then also present that condition of nervous exaltation in which reflex action and morbid reflexes are easily excited, and when abnormal manifestations, both motor and sensory, are present. The physiological and psychical influences operating during the developing years of adolescence, and at the climacteric period of life, tend in the first case to such disorders as epilepsy,

* This chapter is abridged from the Author's 'Practical Points in Gynæcology,' and having been written more recently is substituted for that on the same subject in the last edition.

chorea, suicidal promptings, persecutory delusions, distorted sexual impulses, and more particularly in the latter to the various delusional states attendant upon melancholia or dementia which are then met with. Common among these are those morbid ideas of a sexual nature connected either with the woman herself, or others having relation to her married state. Such terminological divisions in the classification of insanity as 'masturbational,' 'ovarian,' 'climacteric,' 'old maids,' show the recognition by psychologists of such influences. We are not now considering such morbid mental conditions as are consequences of pregnancy, labour, and lactation. These phases of adolescence and the menopause are weaker links in the chain of the woman's life, which, when its strength is tested by any exceptional strain, either by the influence of the environment of her social position and surrounding circumstances, her calling, or accidental occurrences, yield through some pre-existing flaw, and the sudden snap ensues.

At these times '*predisposing factors*,' transmitted by heredity, combine to generate, evolve, and crystallize certain psychopathic tendencies and impulses, which are released by a weakened inhibitory will-power and ineffective nerve-control. Such morbidly impressionable conditions are hyper-sensitiveness to pain, neuroses of the viscera, of the respiratory, circulatory, or digestive systems, and temporary exaggeration of some or all of the temperamental traits which distinguish the individuality of the woman, such as greater excitability, unaccountable fits of depression, irascibility, or lethargy. We employ to such mental types and nervous characteristics the terms '*neurasthenic*' or '*neurotic*.' A stage further, and we regard the state as one of '*hysteria*,' with which possibly we have allied that of hypochondriasis.

With regard to this class of case, in which there is not any pronounced mental affection, it is to be regretted that the subjects of such nervous disorders have their mental symptoms generally regarded either with indifference or suspicion by advisers and friends alike. Frequently it happens that they are practically ignored, while excess of attention is paid to the visceral affection, pelvic or other; or, on the other hand, undue importance is given to them, at the cost of disregarding the source of some reflex disturbance which may be the principal factor in causing the mental instability.

As Dr. Urquhart well puts it, 'The nervous system in slighter or incipient cases may be but slightly affected, and it is in regard to these less marked

cases that special study is so much required. The neglect of careful observation and investigation, in the light of recently acquired knowledge, is much to be deplored. Asylum physicians seldom see the beginning of mental disorder, and although they have asked for information, little has been forthcoming." *

He further says :

'I am one of those who see no real fundamental difference between mental disorder of the technical legal kind and neuroses. They are all part and parcel of the same inherent defect. We cannot narrow our view to the mere facts of disordered mentalization; we must consider the influence and relations of environment, of such conditions as gout and rheumatism.'

Dr. Barraclough,† late of the Wilts County Asylum, says : 'On this point I must speak with no uncertain sound. In my opinion the neurotic temperament is almost as much a predisposing factor as is insanity itself. Very frequently, when the most careful search cannot detect any trace of family insanity, an interview with the parents is sufficient to show whence the inherited tendency lies. I have one case under my care at the present moment who is now hopelessly insane, and who has no family history of insanity, but whose parents are both extremely neurotic, especially the father, and one of whose sisters is very hysterical.' He quotes another case of a similar nature, and goes on to say that it would almost appear that psychopathic predisposition and neurotic temperament are cumulative in their effects, as they are transmitted from parents to offspring, and must ultimately terminate in insanity in the most highly unstable of their descendants.

Dr. Rooke Ley,‡ of the Prestwich Asylum, lays particular stress on psychopathic heredity as the main point to be considered in relation to mental disorders occurring at adolescence, and considers that such 'psychopathic predisposition and neurotic inheritance play a very large part in the causation of disordered mentalization . . . and that the local affection lights up as it were the inflammable material ready for a suitable torch.' And if we take the opinions of gynæcologists generally, we have the same view strongly expressed that psychopathic predisposition is nearly always present when we find a disorder of menstruation or an operation on the sexual organs causing alienation.

Etiological Differentiation.—Herein we meet with the first difficulty in the differentiation, etiologically, of cases of mental disturbance in women in whom a sexual disorder is suspected or discovered. By critical inquiry into the family history and personal temperament or peculiarities of a patient, we may satisfy ourselves as to the part played by heredity, not forgetting the subtle transmissions to the individual through atavism, and thus separate the

* Communication to the author.

† See 'Practical Points in Gynæcology,' 3rd edition, 1902.

‡ Communication to the author.

class of case in which psychopathic factors have prepared the soil for the germs of a mental affection from that in which a sexual disorder appears to act primarily and directly as the exciting cause of the disturbance.

As Claye Shaw well insists, we begin by recognizing the dual nature of sexual delusions—those that are purely mental without relation to the sexual organs, and those which have their origin in the latter: uterine or ovarian disease is commonly present without insanity; or a sexual form of insanity exists without disease of the genitalia; or insanity exists without sexual delusions, while various disorders of mentalization appear to have a distinct relation to diseases of the genitalia. Obviously, it must be most difficult, often impossible, to differentiate between these classes, and no satisfactory conclusion can be arrived at in a proportion of them, without a careful psycho-gynæcological examination. How far such dual examination may be advisable will depend upon such considerations as the age of the patient, the history of previous sexual disorder, and the signs, positive and negative, as well as the symptoms which may be present, of a pathological or physiological nature, indicative of a sexual affection. In the young adolescent our great difficulty is to determine whether the aberration in ovulation is not the consequence rather than the cause of the mental condition; as Yellowlees* says, ‘There can be no doubt that the amenorrhœa is as often the result of defective nerve conditions as their cause.’ ‘Derangements of menstruation,’ remarks Rooke Ley, ‘do act as potent causes of insanity, but to a much less extent than some observers maintain; but they—especially amenorrhœa—are more often the result rather than the cause.’

Instances of disturbance of mentalization during adolescence are amongst the most frequent that the gynæcologist meets with, though not uncommonly the mental specialist is the first, if not the only one, under whose observation they come.

I have had examples of many such cases under my care, and many more in which associated physical and mental weakness or distinct psychopathic manifestations of a pronounced nature have *preceded* the menstrual irregularity and interfered with the process of ovulation. In the great majority of young patients, however, we meet rather with varying aspects of neurasthenia, phases of epilepsy, chorea, hysteria, and visceral neuroses, neuralgias, and disorders of the special sense organs, and peripheral and central reflex irritations.

Masturbation.—So far as masturbation is concerned, we are confronted with somewhat the same difficulty. Is it the cause or the consequence of the nervous and mental perturbation? There can be no doubt that heredity here again plays an important part in the tendency to and persistence of the desire. Some victims are

* Communication to the author.

such by congenital transmission, and in these adolescents it is doubtful if they are ever completely cured and saved from nymphomania, save by the legitimate call on the natural physiological response that alone healthily satisfies the sexual demand.

I have known several instances of women who had no immoral tendencies whatever, whose minds, in regard to all their worldly relations, were stable, active, and intelligent, who commenced, unwitting as to its evil or pernicious nature, the practice of self-abuse, and who persisted secretly in the habit during adolescence without its producing any apparent ill effect.

In relation to the congenital nature of morbid sexual instinct, it has to be remembered that in some females this is developed at a very early age,—in one case under my observation, in a child under five years, so strongly, that it was impossible to leave her for any time in the company of male children. I have seen masturbation associated with every type of neurosis, and I believe it to be a potent factor in the causation, evolution, and development of psychopathic propensities, even to the extent of unnatural indulgences. Yet I have not known any case in which insanity can be traced to this source alone. The presence of some such vice amongst the insane is frequent, but the vicious propensity occurs as only one of many morbid evidences of the neurotic temperament and disposition from which, at the period of developing sexual excitations, it springs. Should such disturbances as melancholia or dementia arise in these women, the vice, by its general influence, both physical and psychical, may help to encourage or perpetuate some delusional or melancholic condition, and render its cure, if the habit be persisted in, all the more difficult.

Clitoridectomy.—Taking these facts into consideration, it is apparent why clitoridectomy has frequently failed to effect a cure of affections which are supposed to be the consequences of masturbation. The morbid reflexes in the great majority of these cases have a central and not peripheral origin, and in most of those in which morbid peripheral excitations are present, they are secondary consequences of the general state of neurasthenia, hysteria, or hysteroneurosis, present. The operation can at best, under such circumstances, be experimental, and the after-effects on the woman's mind may make her last state worst than the first.

Pubescent Insanity.—The vital lesson learnt, both from the etiology and development of pubescent insanity, so far as the young female is concerned, is that the children of neurotic and mentally unstable parents, of too early marriages, of blood relationships, and of alcoholics, require special care and judgment in their companionships, amusements, and occupations, and in the general watchfulness of their tendencies, habits, and mannerisms. And inasmuch as in these we are far more likely than in others to meet with disorders of menstruation, as well as practices of self-abuse, and further, inasmuch as the years from 18 to 25 are those which furnish

the greater number of insane inmates of asylums, amongst whom amenorrhœa and dysmenorrhœa are very common complications, it is essential, if we would prevent the more serious developments of morbid mentalization, that the earlier, and oftentimes subtle, warnings should be recognized. It is unfortunately only too often the case that those traits of character which are ascribed to some peculiarity of disposition or temperament are in reality the first beginnings of a morbid train of ideas, which eventually terminate in a mental breakdown. More likely is this to occur if there be some sexual fault, some error in function, or congenital or pathological abnormality in the generative organs. Though in numbers of cases no prevision nor preventive precautions can avert the mental catastrophe, yet will our recompense be sufficient, even if we can save one life from the stamp and doom of lunacy. Be it noticed also that it is often the brightest, quickest, and most apt in games and accomplishments during growing youth who succumb during adolescence to those predisposing influences of inherited tendencies, passions, and apprehensions which are the forerunners of delusional insanity.

Question of Examination and Operation.—There are questions bearing upon the entire subject which are worthy of consideration. These are—(a) What are the indications for a gynæcological examination of women who are suffering from any form of mental aberration, and under what circumstances is such examination of an insane woman expedient and justifiable? (b) Is operative interference in cases of pathological changes in the genitalia of insane women justifiable, and under what circumstances? (c) Do operations on the female genitalia specially predispose to post-operative insanity, and in what cases is such predisposition most likely to be manifested? Also, do operations on the genitalia of insane women tend to aggravate the mental symptoms?

The following conclusions are in accordance with the evidence collected from a large number of alienists and gynæcologists.

1. Where, in an insane person, ovulation and its external manifestation, the menstrual discharge, are absent or erratic, the erraticism or absence may be a consequence of the general and insane condition, and not a causal factor in its production; but under any circumstances such abnormal menstruation appears to have an aggravating effect on the insanity, and there is sufficient evidence to strengthen the belief that when such irregularity exists—especially if it be due to a pathological cause—it should be treated therapeutically or by operative measures.

2. The question of a gynæcological examination of an insane woman must

be a matter for the discretion of the psychologist, influenced by the gynæcological view as to its expediency from the signs and symptoms present in the sexual organs. For many reasons, as a *universal* practice, in the present state of our knowledge it is not warrantable.

3. Sufficient evidence is now advanced to justify the removal of the adnexa or tumours of the uterus in insane women, when there are gross lesions of the former or tumours of the latter. Here, again, such operations must be advised according to the psychological condition of the patient and the type of her insanity.

4. From a mass of evidence, including some of the largest experiences in Europe, Canada, and America, it does not appear that there is in healthfully minded women, who suffer from diseases of the genitalia, any special risk of post-operative insanity. On the other hand, if there be a psychopathic predisposition, which has existed prior to and independently of the sexual disease, there is in such cases a larger percentage of post-operative mental disturbance than follows other operations. In such women the prudence of a radical operation may have to be carefully discussed. The post-operative mental effect does not appear generally to be of a serious or permanent nature.

5. It may be generally affirmed that when mental disease of a graver type follows upon sexual disorder, there has been in the woman affected an underlying and often unrecognized psychopathic predisposition; the disorder of menstruation or the disease in the genitalia completing the chain of the vicious circle needful for the final manifestation of the mental condition.

6. The relation of aberrant sexual function or a disorder of menstruation to any criminal act ought to be taken into consideration in determining the responsibility of the woman.

It is well to keep quite distinct that numerous class of cases with which we are all familiar, where an absence, diminution, or exaggeration in the genital function, whether associated or not with some congenital or pathological condition of any of the organs, is attended by some abnormal reflex excitation of one or more of the viscera, or a peripheral irritation in a special sense organ, such visceral neuroses and reflex disturbances, with their attendant vasomotor and vascular changes, being the more prominent troubles for which advice is sought.

It is not uncommon to find some phase of neurasthenia, hypochondriasis, or mild type of melancholia present, and, speaking generally, the neurotic temperament. All these various hystero-neuroses have been frequently written about since Tilt in England, Fordyce Barker and Engelmann in America, Shroeder and Hegar in Germany, insisted on their dependence upon some uterine or ovarian affection. It has, however, to be remembered that a large number of women find their way into asylums who have never consulted a gynæcologist, yet who suffer from various diseases of the genitalia, and disorders of menstruation. And this fact will, of course, largely influence any conclusion arrived at from a gynæcological record alone.

Joseph Wigglesworth, as far back as January, 1885,* showed the condition of the uterus and its appendages in 109 insane individuals, as ascertained by examination after death. This is a most complete table, giving the age, social state, form of mental disorder and its duration, with the cause of death, and the condition of the uterus and the appendages as found at the autopsy. In a second table he shows the condition of the uterus and its appendages in sixty-five insane patients, as ascertained by examination during life. Out of the 109 autopsies, in 55·0 per cent. fibromata were found. In two of these they reached considerable size, and 'there was evidence derived from the history of the patients, and the mental symptoms, that the tumours were important *contributory* factors in the production of the melancholia from which both patients suffered.' Of the sixty-five cases examined during life, two had fibroid tumours of the uterus. In one, the correlation between the tumour and the sexual delusions from which the patient suffered was not established from the duration of the mental affection; in the other there were delusions as to torture inflicted by instruments introduced into her womb. 'These delusions have existed for two or three years at least, and appear clearly to depend upon the growth of a fibroid tumour in the fundus of the uterus. Though the tumour is not at present producing any marked physical effects, it is legitimate to inquire whether operative interference might not be justified, in order to rid the patient of what seems to be such a source of misery to her.'

[There can be now no doubt that hysterectomy would have been justifiable in such a case.]

Rohé, in the Maryland Hospital, and Hobbs, of Ontario, during five years had 800 insane women under observation, and of these 220 were examined by a gynæcologist. One hundred and eighty-eight, or 85 per cent., of those examined had distinct, and in many cases serious, lesions of the pelvic organs, there being 371 lesions in the 188 patients. It is interesting to note the nature of these lesions—subinvolution or endometritis in 132, diseased or lacerated cervixes in 62, retroversion or prolapsus in 66, myomata in 16, malignancy in 2, disease of the adnexa in 33, various lesions of the vagina in 37. Eighteen women suffered from dysmenorrhœa or menorrhagia. These of course were cases specially selected as likely sufferers from pelvic disease, and were about 25 per cent. of the entire number of patients in residence during the time in which these investigations were conducted. There were 311 operations performed on the 173 women, as follows:—A hundred and thirty-one curettings, 53 trachelorrhaphies, or amputations of the cervix, 37 Alexander's operations, 13 ventrofixations, 27 perineorrhaphies, 22 ovariectomies, 14 abdominal and 9 vaginal hysterectomies, 3 myomectomies, and 2 cœliotomies for tuberculous peritonitis. Without going into details, the summary

* 'Uterine Disease and Insanity,' *Journal of Mental Science*, January, 1885.

of the results of operation in these cases is as follows :—Seventy-three, or 42 per cent., recovered mentally ; forty-one, or 24 per cent., were improved mentally ; in fifty-five, or 32 per cent., there was no change in the mental condition ; and four, or 2 per cent., died. Hobbs appends some most striking instances of rapid recovery after the gynæcological operations. He is not oblivious to the obvious criticism on such statistics, that a certain proportion of these women would have recovered from the disordered mental state without any operation.

He contends that, taking eight years in the history of the asylum, the introduction of gynæcological surgery as an adjunct of treatment has improved the percentage of recoveries, from 33 per cent. to 51 per cent. on the admissions ; and he compares the results following from cure of the affections of the sexual organs with recovery resulting from the surgical treatment of inguinal hernia by the Bassini method in 23 cases, as in the latter no improvement in the mental condition followed, though the subsequent nursing of the patient was the same in both instances. Another interesting point that Hobbs dwells on is a comparison of the relative importance of the various sexual lesions in the production or maintenance of cerebral disturbance. Of the inflammatory utero-ovarian affections, in 96 cases treated the recovery was 50 per cent. ; in 47 cases of utero-ovarian displacements corrected, there was 36 per cent. of recoveries ; and in non-inflammatory utero-ovarian and vaginal lesions, there was 26 per cent. of recovery. In no instance did the administration of an anæsthetic in the 600 anæsthetizations make any difference in the mental state of a patient. They were neither better nor worse. Ernest Hall* gives a table of 75 cases of insanity in women, in whom in only 4 cases examination failed to detect some affection of the sexual organs. In 21 of the entire number there was a previous history of pelvic disease, and on examining the nature of the affection present in these 71 women, one is struck by the fact that only one instance of uterine myoma or other uterine tumour is recorded. By far the larger proportion suffered from lacerations of the perineum and cervix uteri, or displacements of the uterus, tumours, and chronic inflammatory conditions of the adnexa.†

Hall gives the results of operative treatment in 38 cases of insanity. In some the operations were of a complex character—as,

* *Pacific Medical Journal*, April, 1900.

† See also communication by the same author in the *Brit. Gynæc. Journ.* Nov., 1900 : ‘The Gynæcological Treatment of the Insane.’

for example, removal of the appendages and ventro-fixation, amputation of the cervix, oöphorectomy, and ventro-fixation. The operations thus performed were—Curettage, 9 ; operations on the cervix, as amputation of the cervix and trachelorrhaphy, with perineorrhaphy, 11 ; oöphorectomy and salpingo-oöphorectomy, 20 ; resection of the ovaries, 10 ; salpingotomy, 1 ; ventro-fixation, 9 ; supra-vaginal hysterectomy, 1 ; vaginal hysterectomy, 1 ; colpotomy, 2 ; hæmorrhoids, 1. Out of the 75 cases, only 2 had had a previous gynæcological examination. Of those operated upon, we can classify the results as follows:—6 complete recoveries, 7 partial improvements, 3 temporary improvements, 9 slight improvements, and 5 negative results. One case of acute mania died nine weeks after the operation, from meningitis ; 1 died nine days after operation, from meningeal congestion and septicæmia ; 1 died nineteen days after operation, from the bursting of a secondary abscess into the peritoneal cavity ; one died on the eighteenth day after operation, namely, a case of curettage, with suspension of the left ovary and ventro-fixation : there was no post-mortem.

Mary Dixon Jones mentions, from evidence she has collected, that salpingo-oöphorectomy or oöphorectomy was successfully performed on eighteen women for affections of the nervous system, with the result of a complete cure. Réné (one of the first psychologists who insisted on the correlation of genital disease and insanity), George Engelmann, Roke Ley, Laphorn Smith, and others, have collected evidence showing the same correlation. Striking individual examples have been published by Japp Sinclair, Christopher Martin, and Halliday Croom. In three cases complete recovery followed operation.

Roke Ley urges “that uterine displacements and tumours do undoubtedly cause and perpetuate mental disorders, and induce delusions referred to the neighbourhood of these organs, and that ovarian tumours act in a similar way.” Amongst psychological authorities in England there is considerable scepticism as to the benefit to be derived from operative interference. There is, however, no bias or prejudice, but an open mind, in regard to the question.

With regard to the question, Do gynæcological operations predispose to insanity? I have drawn on the experience of some of the greatest of living operators. The conclusion, almost universally expressed, is that stated almost in the same words by A. Martin* and Schauta.* The view of the former I have already given. Schauta

* Communications to the author.

says : ' I never saw, in a healthy woman, any disturbance of mind after an operation. . . . There is always ' (in such a case) ' some predisposition.'* ' I have not,' says Hegar,* ' observed any psychosis succeeding an antecedent major operation on the female genitalia.' ' In over 4000 operations on women,' says Lapthorn Smith,* ' of which over 500 were abdominal sections, there was not a single case of insanity following the operation.' Christian Simpson quotes Homans as having two cases in 1000 laparotomies, including several hundred ovariectomies and hysterectomies. Lawson Tait had no case of insanity in his practice up to 1890. Spencer Wells had but two cases arising out of ovariectomy, and Granville Bantock's experience coincided with that of Tait up to the same date. Savage collected records of 4 cases of insanity out of 483 cases of double salpingo-oöphorectomies ; and Keith, in 64 hysterectomies, with removal of the ovaries, had 6 cases of insanity. These last statistics appear to show an unusually large proportion, but it has to be remembered that septic conditions exert a marked influence in the production of post-operative mental disturbance, and that those operations were performed at a time when the mortality was large from septicæmia, and septic complications even in those who recovered were not infrequent. I have never seen any injurious mental consequence follow a gynæcological operation in a healthy woman ; and in the only two in whom symptoms of post-operative insanity appeared, one had previously been in an asylum, and the other, an official in a private one, had been a typical neurasthenic for some years.

Indications for Examination.—With regard to the indications for, and the circumstances under which, a gynæcological examination of an insane woman is expedient and justifiable, Robert Barnes advocated the elimination, by examination if necessary, of the presence of any sexual disorder in a woman before confining her to an asylum. That this is a rational conclusion, in view of our present knowledge, is, I think, clear. It does not necessarily involve an internal examination of the genitalia ; for an inquiry into the past history of the patient, together with the circumstances under which the first evidences of alienation appeared, will generally enable us to exclude the possibility of there being any interference with the discharge of the functions of her sexual organs. Such an inquiry will also assist us in arriving at the conclusion that symptoms of mental disturbance preceded any interferences of function, or *vice versa*.

* Communications to the author.

Such a careful investigation giving us negative results, will influence us against the necessity for proceeding further. Also, obviously, in a fair proportion of cases there will be within our knowledge other causes predisposing to and producing the insanity. Take, for example, the frequently occurring one of heart disease as a physical, and disappointment in love affairs or mental worry, as a psychical, cause. Or again, we may verify the habit of masturbation. Such careful inquiry will also elicit the proofs, both by symptoms and signs, of previous pelvic disease, whether in the uterus, adnexa, or external genitalia. Should this exist, we have a clear indication for the determination of the extent and nature of the disease, and its probable effect on the mental condition. The age of the patient, and her state, whether married or single, will influence us. The disorders of menstruation, so frequent during the years of adolescence, have commonly no local pathological explanation. We have, however, to remember that the causes of these are often congenital. A persistent dysmenorrhœa, menorrhagia, or metrorrhagia would certainly indicate the need for examination, as would a suspicion that the uterus was retroverted. Permanent amenorrhœa would arouse suspicion of atresia of either uterus or vagina, and the possibility of partial or complete absence of the genitalia has to be recollected. In married women there is not the same reluctance to examination; the causes of disorders of menstruation are more likely to be pathological; and consequently the indications for examination are generally more obvious. During middle life also we have all the parturient and puerperal sources of insanity requiring investigation. At the advent of and during the menopause, should any striking deviation from the natural course of cessation of menstruation precede or accompany the insanity, an examination should be made, for the same reason that we advise it in ordinary cases, namely, to escape the error of overlooking any serious pathological condition of the adnexa and uterus. This being so in the case of the sane woman, it is even more so in the case of the insane, where we have the additional reason of the mental condition being attributable to any disease that may be present.

Indications for Operation.—With regard to the question of operative interference in cases of pathological changes in the genitalia of insane women, all the evidence before us, of which there is no reason to doubt the accuracy, shows that such interference is called for—(a) When, on weighing the etiological factors in the causation of any particular case, they point to a causal relationship between the sexual disorder and the disturbance of mentalization. (b) When observation of the patient shows that the pelvic disorder aggravates the insanity by intensifying delusions, directing the mind morbidly to the sexual organs, increasing the severity of periodical outbursts, or by their influence on the physical well-being preventing improvement of the mental state. It is for the psychologist to decide the most favourable time for operation, and the contra-indication that may be presented by the phase and type of the insanity.

Lastly, with regard to the third point raised, as to the occurrence of post-operative insanity after gynæcological operations, I have already answered this question. It certainly does not appear, from the published records of operations performed on the insane, that the symptoms have been thereby aggravated, save in very few instances, and in these the effect does not seem to have been permanent.

Use of Ovarine in Sexual Insanity—As stated in the text, the ovarian secretion has been used largely for the various symptoms arising after removal of the ovaries, and has also been employed in many cases of dysmenorrhœa, amenorrhœa, and anæmia arising out of affections of the ovaries. Mainzer at Berlin, Chrobak at Vienna, Muret at Lausanne, Jayle in Paris, were amongst the first who employed the ovarian secretion in these functional disorders of menstruation, both in the induced and prematurely occurring climacteric, and various cases have been reported of benefit consequent upon its administration in such affections. No evil results have followed from its use. The method of administration recommended is the ovarine powder, after desiccation, either in cachet, tablet, pills, or, preferably, as palatinoids.

In an extensive critical review of the entire subject of the internal secretion of the ovary,* Henry Russell Andrews epitomises the results of the experiments which have been made by Neumann, Curatulo, Tarulli, and Falk, and also the question of a ganglionic plexus and ganglion, as discussed by Elizabeth Winterhalter and von Herff. He summarizes the result of ovarian medication as practised by Brown Séquard, Mainzer, L. Landau, Bodon, Jayle, and others, up to the time of Bastion de Camboulas in 1898, and Cohn and Seeligmann to Flockemann in 1901. From the reports of some of these authorities it would certainly appear that the ovarian secretion has a good effect in affections of the climacteric, and, to a less extent, in chlorosis and amenorrhœa. It has been given in this country mainly in the forms above mentioned, and abroad as fresh gland, the ovaries being minced and given in sandwiches—a very difficult method, not only from its repugnancy, but from the impossibility of keeping them fresh. It has also been administered in form of a powder of the dry gland under different names, and, as juice or fluid extract, watery glycerinated, or alcoholic. The most active ovaries are those of the sow. Those of heifers are not so active, and cows are liable to tubercle. I have for some years been administering ovarine in tabloid or palatinoid form, but I cannot speak with confidence of their permanent effects when taken without any other agent. The influence of transplantation of the ovary on menstruation has already been discussed.

* 'The Internal Secretion of the Ovary,' H. Russell Andrews, *Jour. Obstet. and Gyn. Brit. Emp.*, May, 1904.

CHAPTER XI.

UTERINE DISPLACEMENTS.

Important Displacements.

Anteversion.

Retroversion and Retroflexion.

Prolapse.

Ascent.

Inversion.

Anteversion.

As the uterus in the normal condition lies anteverted in the pelvic cavity (Fig. 158), it is not, strictly speaking, correct to regard "anteversion" as a "displacement." Owing to pressure from above, or posteriorly, or from the yielding of its supports, above, below, or at the side, or from contractions or adhesions which drag on it anteriorly, the fundus uteri is thrown further downwards and forwards in the pelvis. Ultimately it is so far *displaced* out of its *proper* axis to the pelvic brim that it rests against the bladder, while the os uteri is carried back towards the pouch of Douglas. As we might suspect from the normal inclination of the uterus, and the influences which operate in producing an exaggeration of it, we find this a common uterine displacement. In its worst form it is most distressing to the patient, and difficult to relieve.

Any of the affections I have just grouped as consequences of displacements may result from extreme anteversion. Those that are found as the most frequent attendants on it are—amenorrhœa and dysmenorrhœa, uterine congestion, uterine fibroid, stenosis, sterility,

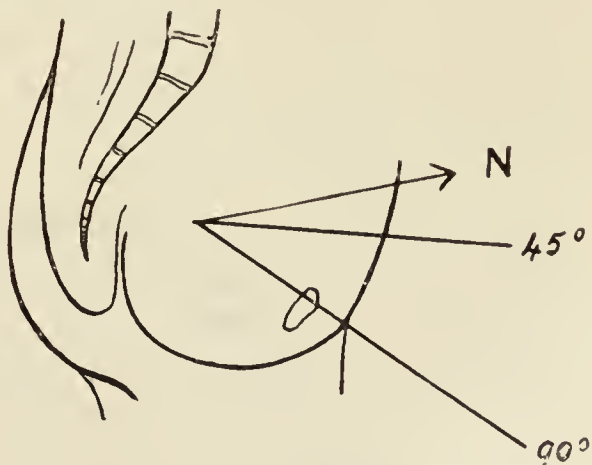


FIG. 158.—DEGREES OF ANTE-VERSION.

vesical and rectal distress, uterine prolapse, locomotor symptoms, sacral and lumbar pains, ovarian congestion, and ovaritis. *It is a safe maxim in gynæcological practice to look outside the bladder itself for the cause in any case where there is difficulty before or during the act of micturition, or evidence of retention of urine.* We shall very frequently find it in an anteflexed or retroverted uterus. In like manner, when there is tenesmus, or a sense of pressure in the rectum and general rectal distress, with the passage of fæces which are in form suggestive of stricture, we may discover the cause in uterine displacement.

Diagnosis.—If we suspect the malposition, there is no difficulty in quickly verifying our suspicions. *We might, if careless, confound both anteversion and anteflexion with a fibroid of the uterus, or a vesical tumour.* We are liable to overlook the pathological condition attendant upon or preceding the version—as, for example, an *intra-mural fibroid, subinvolution of the uterus, simple hypertrophy, an intra-uterine polypus, adhesions, metritis or perimetritis.* While we may therefore prove satisfactorily that the uterus is anteverted or anteflexed, we must, by a searching digital and bimanual examination in the manner previously described, and with the sound if necessary, exclude any possibility of such complications being present. By digital examination, the absence of the cervix from the fornix of the vagina, its position posteriorly in the sacral hollow, and the detection anteriorly of the hard fundus (less so in the dorsal decubitus) will show that the uterus is anteverted. By abdomino-vaginal examination we can get the entire organ between our hands, and satisfy ourselves that the mass which is felt anteriorly is the fundus uteri. If there should be still a doubt or suspicion of other complications, it may be necessary to complete the diagnosis with the sound.

I repeat here the obstetric axiom — *Do not take the uterine sound in hand in any case in which there is a suspicion of pregnancy.* Most necessary is it to recollect this rule in the instance of an enlarged and anteverted uterus. Should the possibility of pregnancy be excluded, more especially if we desire to use the sound both for a diagnostic and therapeutic purpose, we may pass it. This, at times, is not such an easy operation. It may be difficult, even when the sound is well curved, to get it into the os uteri in extreme anteversion. Some old flexion may impede its progress; so may also a uterine growth. The important lesson we must learn is, to use no force in the attempt. By carrying the handle well back, or by giving the instrument various degrees of curvature, we shall succeed by gentleness and not by force.

Treatment.—Having determined the degree of mobility of the uterus, we can, with the fingers of the right hand carried deeply behind the pubes, press the fundus upwards and backwards, while at the same time we steady the cervix with a finger of the left hand in the vagina, and draw it forwards. Should the uterus be so fixed that we cannot succeed in this manœuvre by the fingers, it is seldom that we can safely effect much greater permanent improvement in position by the sound. Recollecting the etiology of anteversion, it is obvious that the mere reposition of the uterus is frequently the least part of the practitioner's duty. The general health of the woman must be carefully attended to, and her secretions regulated; congested and hypertrophic conditions of the uterus, contractions of the cervical canal, any complicating tumour or effusion, ought, as far as possible, to be rectified, and any abdominal pressure relieved. In the meantime, we endeavour to raise the fundus uteri, and retain it in position by a pessary; and the best I know of is that of Galabin (Fig. 159).

It must be clearly understood that all these remarks refer to an *extreme degree of this form of uterine displacement*.

'I have learned,' says Goodell, 'to unlearn that anteflexion and anteversion in themselves—that is to say, as displacements merely, and without narrowing of the uterine canal—are necessarily pathological conditions of the womb. The mistake made, as I have more elaborately shown in my "Lessons on Gynæcology," is in attributing to this natural position of the womb the various forms of pelvic trouble, especially that of irritability of the bladder, to which women are so liable. But the sympathy between the brain and the bladder is a remarkably close one—so close, indeed, that some physiologists contend that "every mental act is accompanied by a contraction of the bladder." A nervous bladder is, then, one of the earliest phenomena of a nervous brain, for nervousness means a deficient control of the higher nerve-centres above the lower ones—a lack of brain control. Now, a hysterical girl, or a woman whose nervous system has given way under the strain of domestic cares, consults the physician for such ordinary symptoms of nerve-exhaustion as wakefulness, utter weariness, a bearing-down feeling, backache, and perhaps, above all, an irritable bladder. Upon making a digital examination, he usually finds the fundus of the womb resting on the bladder, where it naturally should rest. At once he jumps to the conclusion that the whole trouble is due to pressure of the womb on the bladder—viz., to the existing natural anteversion, or to the anteflexion, as the case may be. Enticed away by the vesical lapwing from the bottom factor—the shattered nerves—he now makes local applications, and racks his brains to adapt or devise some pessary capable of overcoming the supposed difficulty, heedless of the dilemma that the upward, or shoring, pressure of the pessary on the bladder must be greater than the counter, or downward, pressure of the womb, to which he attributes the vesical irritability.'

Pessaries.—While the rash or indiscriminate use of pessaries is to be strongly condemned, I desire, on the other hand, not to be understood as undervaluing the assistance in treatment we obtain through the well-adjusted pessary. In all forms of displacement *where its employment is clearly indicated*, it generally gives material relief. I know few steps in gynæcological therapeutics attended with such obvious and immediate benefit and comfort to a patient as the restoration of a retroverted uterus to its normal position, and its support and retention by a well-fitting pessary. In the same manner, in the varying degrees of descent of the uterus which more or less accompany all versions and flexions, with a pessary suited to the case we immediately secure that sense of support, and prevent the bearing-down feeling and associated pain which are so distressing. By replacement of the uterus, the use of a pessary, and the adoption of the postural plan and periodical reposition in the knee-elbow position, in cases of retroversion the uterus and its supports can be restored to a healthy state, so as in time to obviate the necessity for any mechanical appliance. In graver degrees of displacement a mechanical support is a tedious and frequently disappointing mode of treatment, and ventro-fixation, ventro-suspension, or shortening of the round ligaments, is the quickest way to restore the woman to health and strength.

There are some safe rules to observe in regard to the use of pessaries :—

1. Always, by the vaginal and recto-vaginal methods in the dorsal and lateral positions, make a careful digital exploration of the vagina and uterus before their application (the rectum and bladder being empty).

2. In anteversion and anteflexion, if there be uterine congestion, sensitiveness, or enlargement, avoid the use of a pessary until such conditions are relieved.

3. The uterus should be replaced before introducing any pessary.

4. *Whenever possible, mould and fashion, from a celluloid ring or pliable metal, the pessary you require, and regulate its size and shape, or lever-power, according to the degree of version or flexion, the tightness of the vaginal roof, and the capacity and muscular tone of the vagina.*

5. Always teach the patient how to remove a pessary, should any pain or discomfort arise from its use. In many instances it is equally easy to teach her how to reinsert it; but, as a rule, this should be done by the practitioner.

6. See the patient occasionally at first, so as to ensure comfort in the use of the appliance, to detect any accidental displacement, and to watch for any vaginal irritation. Patients wearing pessaries should be kept under observation, and periodical cleansing of the vagina with a disinfecting solution prescribed. Strict attention must be paid to the bladder and rectum. In the case of a married woman, endeavour always to select a pessary that does not interfere with coitus.

7. When adnexal disease is present, avoid all pessaries.

I do not believe that any verbal description can teach the proper selection or the correct adjustment of a pessary. This must be learned in the hospital ward, in private practice, or in the extern obstetric department of a hospital. In anteversion our object is to raise the fundus, and place such a support anteriorly as will prevent it relapsing into its old position. In many cases of anteversion sufficient support for the uterus can be obtained from a ring moulded to suit the case. Celluloid rings of different sizes can be readily converted to act on the principle of the Galabin, by dipping them into very hot water, giving any shape we desire. We can rapidly shape from such rings a Hodge, with the arms of the lever of any length or form we wish. When the ring has been so moulded, it is dipped for a few seconds in cold water to set. With these rings we are enabled to adapt, for the case before us at the time, a



FIG. 159.—GALABIN'S PESSARY.*



FIG. 160.—ANTEVERSION PESSARY.
Moulded from Schultze's Ring.

pessary of any size or shape we think applicable. Galabin's pessary I believe to be the most generally useful one in anteversion. It should be inserted and removed by the surgeon. It is made of vulcanite (Fig. 159). 'In introducing the instrument, it is at first passed entirely within the vulva, with the upper limb in front of the cervix; the index-finger is then carried through it, and hooks the upper limb back over the cervix and into the posterior cul-de-sac.' In using this support, it is essential to see that it fits comfortably, and is neither too tight nor too loose in the vaginal canal.

Fig. 161 shows Grailly Hewitt's cradle-pessary. We introduce it by pushing in the large ring of the pessary through the vulva, pressing it steadily in an oblique manner upwards and backwards; the summit of the instrument is then carried into position in front of the uterus, its lower end being pushed gently upwards.

The rubber pessary of Blackbee will be found easy of

* I have ceased to use any other pessary in anteversion than this of Galabin—unless I mould a ring suitable for the case, giving it a shape somewhat like a sledge-shaped Schultze's.

application. It can be adapted both for anteversion and retroversion.

Fowler's pessary is more applicable for retroversion, and I rarely employ it for anteversion, still, it will be found in both forms of

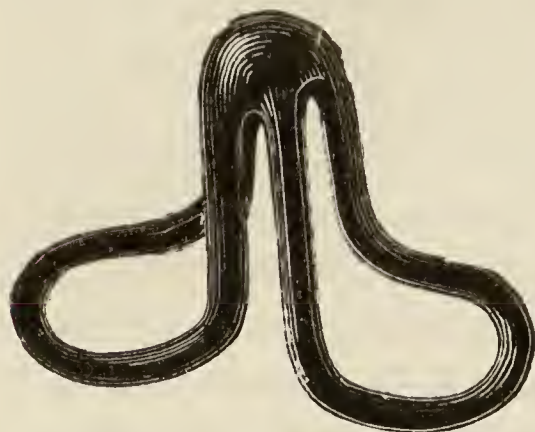


FIG. 161.—HEWITT'S PESSARY.

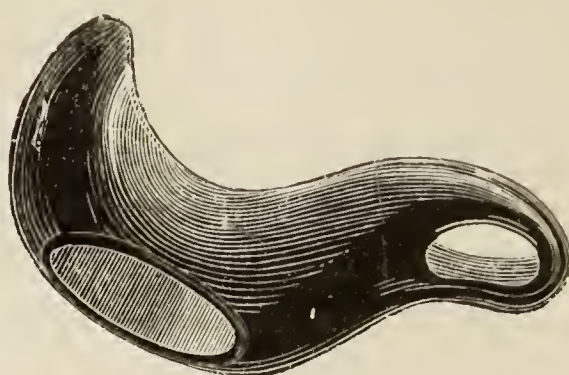


FIG. 162.—FOWLER'S PESSARY.

displacement a safe, easily applied, and useful pessary by the general practitioner (Fig. 162).

A caution is necessary in regard to this and any hollow vulcanite pessary. Should any small crack or opening be made in the instrument, it becomes foul and imprisons decomposing secretions. The principle of this pessary can generally be easily shown to the patient, and she may be taught how to remove and replace it. This is not possible with some women, and it should then be periodically removed by the surgeon and examined. The pessary as made by Messrs. Arnold is not open to the foregoing objection.

One of such a size should be chosen as will not incommode the cervix or the vagina.

When the pessary is in position, the neck of the uterus is received into the cup of the support, *and the curved anterior portion, with the small opening for the finger to facilitate introduction and removal, lies in front of the uterus.*

Anteflexion.

Anteflexion may be either congenital or acquired. The body of the uterus is bent forwards over the cervix, and the axis of the cavity of the fundus uteri no longer forms a continuous and slightly curved canal with that of the cervix, but is placed at an angle, varying in degree according to the extent of the flexion. The cervix may be directed forwards at various angles, while the cavity of the fundus retains its normal axis; or the flexion may occur both in the body and neck of the uterus, an extreme degree of angular constriction at the isthmus uteri resulting.

The lesions anteversion and anteflexion blend into one another. There has been a state of anteversion prior to the flexion. In primary anteflexion this displacement may not give much trouble until after marriage, when the increased stimulus to menstruation excites a more profuse menstrual discharge, and the obstruction to its flow caused by the flexion produces dysmenorrhœa. On the other hand, it may be accidentally discovered, and should always be remembered as a likely cause of severe dysmenorrhœa occurring with the earlier periods in young girls.

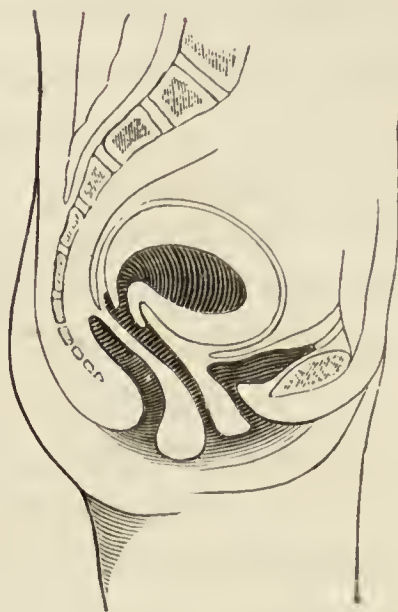


FIG. 163.—ANTEFLEXION OF UTERUS. (SCHROEDER.)

Causation.—An acquired anteflexion may be induced and promoted by any of the influences mentioned as tending to produce anteversion. I have already referred to the importance of a free circulation at the ‘axis of suspension’ (Barnes) of the uterus. Obstruction here must lead to venous congestion, congestion to interstitial hardening, or hypertrophy, and, as a result, either morbid growths or secondary contractions are formed. In no situation should we more naturally expect these to occur than in the anterior wall of the uterine fundus. Increase of size demands larger arterial blood-supply, and, consequently, we have not alone greater habitual venous congestion, but the periodical determination of blood at the menstrual period adds to the general uterine derangement. Any further obstruction to the free flow of blood still more increases the evil. The vicious circle may commence either in morbid processes promoting congestion and weight in the uterine wall, or in an interruption to the circulation at the ‘axis of suspension,’ with consequent alteration of tissue at this part. These conditions may be secondary to pathological extra-uterine states, such as tumours, adhesions, inflammatory effusions, a retro-hæmatocele, pressure from the rectum posteriorly, or from the abdominal viscera above. Or this initiatory mischief may be associated with ovarian congestion, inflammatory effusion in the broad ligaments, contraction and thickening of the Fallopian tubes, and occasional perimetric attacks.

Symptoms.—The symptoms depend to a great extent on the degree of flexion, the size of the body of the uterus, the accompanying stenosis, the pressure on the bladder, or such complications as

metritis, endometritis, and perimetritis. The hypertrophied fundus with its enlarged vessels, or possibly a small anterior mural fibroid, explains the menorrhagia frequently seen in these cases. Sterility being a common consequence of ante flexion, it is frequently present, with many of its attendant ills. In addition to the dysmenorrhœa, there is occasionally dyspareunia, an irritable and sensitive vulvar orifice and vagina, a sensitive and congested cervix, with pain on pressure in the posterior fornix of the vagina, caused by a swollen and sensitive ovary. The pressure on the bladder brings frequent desire to pass water, with difficulty of retention; there is constantly a sense of weight and pain when the patient stands or walks for any time, and neuralgic pains occur in various parts.

Diagnosis.—This, with the exercise of any care, is not difficult. A digital examination detects the solid body of the uterus lying anteriorly, and the angle of flexion marked by the presence of a sulcus, beneath which the cervix lies in the axis of the vagina, if it be not drawn out of position by adhesions or cicatricial contractions. Care must be exercised, *if the flexed cervix be drawn anteriorly, not to mistake the displacement for a partial retroversion or retroflexion.* The uterus occasionally, in ante flexion, lies low in the vagina, the process of descent proceeding at the same time as the forward displacement.

Having so far detected the ante flexion, it is well to make a careful examination of the vaginal roof, search the anterior and posterior fornices for any contracting bands, or any perimetritic effusions, while we ascertain with the finger the degree of mobility of the uterus. Still retaining the finger in the vagina, we make a careful bi-manual abdomino-vaginal examination, determining the size and mobility of the fundus uteri. If doubt still exist as to whether the tumour be an intra-mural fibroid, or some effusion which may have formed in front of the uterus, we must complete the examination with the uterine sound. This we may find some difficulty in passing. It may have to be withdrawn, and a new curve given it according to the degree of flexion, before we can succeed. When we have introduced it, we can satisfy ourselves of the exact shape, direction, sensitiveness, and degree of mobility of the uterus, and judge of the space between the finger and the sound by feeling the instrument through the uterine wall. Should we experience a difficulty in passing the sound, in a case of ante flexion, we may assist the introduction of it by pressing up the fundus with a finger in the vagina, the handle being carried well back to the perineum. If we

succeed, the sound is brought steadily, but neither forcibly nor suddenly, forwards, and the fundus is raised. By such an examination as this, it is hardly conceivable that we can mistake the case of anteflexion for one of fibroid, or *vice versâ*, and overlook effusions, any old adhesions, or a vesical tumour or calculus.

Our conduct of the case by local interference will depend on—

- (a) The discomfort caused by the flexion ;
- (b) The extent to which local measures, as the introduction of the sound, occasional reposition, and the use of a pessary, afford relief.
- (c) The presence of such complications as perimetritis, endometritis, uterine fibroids, or adhesions.

Every case of anteflexion must be treated on its individual merits. When we find that local manipulation is ill borne, that any inflammatory conditions coexist, and that we fail, after reasonable and judicious efforts, to restore the uterus to its proper position, it is better not to push our efforts, but rather to pay careful attention to the bowels, to encourage retention of urine and rest in the dorsal decubitus, to apply the most comfortable vaginal support, and periodically to replace the uterus with the finger. Otherwise the primary indications for treatment are clear—the first, to try to restore the uterus to its normal shape and position ; the second, to retain it by mechanical means in its proper place, while we correct the flexion and establish the patency of the uterine canal. The

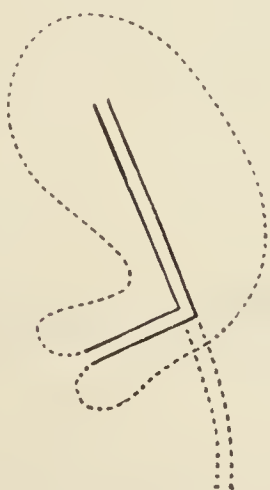


FIG. 164.—SIMS' OPERATION FOR CREATING NEW UTERINE AXIS.

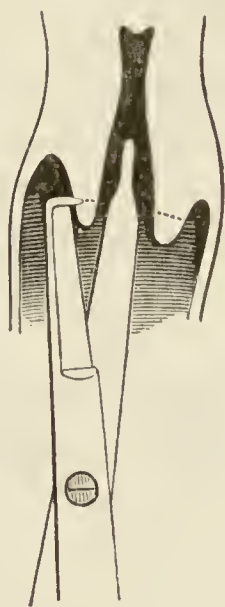


FIG. 165.—BILATERAL DIVISION OF THE CERVIX WITH KUCHENMEISTER'S SCISSORS.

first is effected by the uterine sound, aided by the finger in the manner already described ; the second object we endeavour to

accomplish by a suitable pessary, and, if necessary, by the use of an intra-uterine stem to straighten the canal. The general principle of relieving local congestion, and treating any inflammatory conditions of the endometrium, or the uterine appendages, before we trust to a mechanical support, is to be observed. In short, when a case of painful anteflexion presents itself, our duty will be to subdue any local inflammatory state, and endeavour to replace the uterus. If the uterus be sensitive and congested, a few scarifications of the cervix will in all probability give temporary relief, while glycerine and ichthyol tampons have both a sedative and depletive effect. The tampon is moistened with a mixture of one part of a ten per cent. solution of ichthyol, one part of extract of hydrastis, one part tincture of iodine, and three parts of glycerine. If there be stenosis (with dysmenorrhœa and sterility), we dilate the canal, commencing with a small bougie, and gradually increasing. Meantime we should, when it can safely be done, at periodical intervals gently retrovert the uterus with the sound, replacing the pessary while the uterus is thus retroverted. The step that frequently gives the most relief is section of the cervix uteri.

Sims' Incision.—The probe point of Kuchenmeister's seissors should be introduced for about three-quarters of an inch, and the cervix divided not quite up to the vaginal reflexion. We now incise the os internum with Sims' knife, already described, p. 145, which is the best instrument we can use, the operator having it directly under his control.

The patient is placed in the dorsal position. The cervix is brought well into view, and is held securely by a tenaculum. The blade of Kuchenmeister's seissors is next introduced (the canal of the cervix may, if necessary, be dilated previously), and the posterior cervical wall is divided, as has been just described; Sims' knife is now taken and introduced through the internal os, and the posterior cervical wall is laid open. Every precaution already insisted on when referring to division of the cervix for malformations



FIG. 166.—DILATOR FOR STRETCHING CERVICAL CANAL AFTER INCISION.

By closing the handles the blades expand.

and stenosis has to be taken.* The operation should be performed a few days after a menstrual period. We must insist on the need for rest and care until

* See chapter on Minor Gynæcological Operations.

after the next menstrual epoch. The patient should be kept in bed for some days. There is a certain, though slight, percentage of risk in all such operations.

The operation, however, which gives most satisfactory results is that which we have already described, and consists of: (1) bilateral incision of the cervix, reaching nearly to the vaginal reflexion; (2) crucial incision of the stenosed portion; (3) free dilatation with dilators of the divided canal; (4) closure of the cervical wounds; lastly, the insertion of a strip of sterilized iodoform gauze when all bleeding has ceased. This gauze is not disturbed for forty-eight hours, during which time the vagina is loosely tamponed with some sterilized iodoform and ordinary gauze. Subsequently the dilatation of the canal is preserved by the occasional passage of an ordinary dilator.

Plastic Operations.—Professor Vulliet introduced a plastic operation for obstinate stenosis of the cervix.* It involved a rather free dissection of the anterior vaginal wall at its attachment to the cervix, and the cutting of a large uterine flap after the division of the cervix. It is an operation which is tedious and can seldom be called for, in view of the simple and equally efficacious procedures.

Dudley's Operation.—With the view of obviating the tendency to closure of the cut surfaces after division of the uterus for anteflexion, and with the further object of straightening the canal, Dudley of Chicago has devised an operation, which George Keith, who himself practises it, thus describes:—

“As this operation may have to be performed on unmarried women, the smaller end of the smallest-sized Sims' speculum, three-quarters of an inch in width, must be the one selected in such cases. It is thus unnecessary to rupture the hymen unless it be very small. The vagina is sterilized, a tenaculum is fixed into the centre of the anterior lip of the cervix, and the uterus is drawn slightly downwards to straighten the bend as far as possible. A sound is passed to determine the exact direction of the canal, which is then thoroughly dilated. This is followed by curetting, a large quantity of fungosities being usually removed. The operator then takes the tenaculum in the left hand, and with knee-bent scissors in the right cuts through the whole thickness of the posterior lip of the cervix almost to the vaginal mucous membrane. There are now two cut surfaces, the upper or right, and the lower or left, and each requires to be sutured separately. It will be seen that if the cut surface on one side be doubled on itself so that the point touches the base, and the same is done on the other side, the point, *i.e.* the os, must be either drawn backwards or the base must be drawn forwards. What happens is that the os is drawn backwards at the vaginal junction, and fixed in this position by sutures. The stitches are put in in the following way: The needle is passed through the whole thickness of the point on one side and from the vaginal surface to the cervical, and in the reverse direction

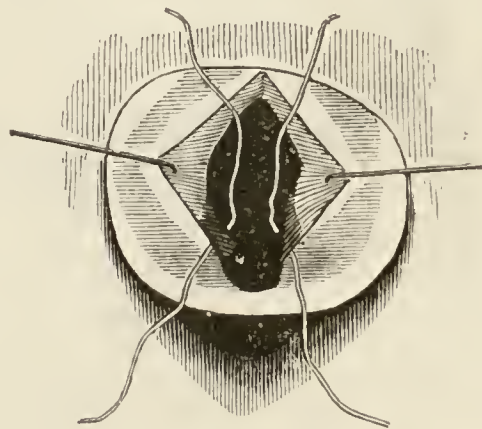


FIG. 167.—DUDLEY'S OPERATION. APPLICATION OF SUTURES. (KEITH.)

* *Centralblatt für Gynäkologie*, Jan. 20, 1894.

through the whole thickness of the base. The stitch is then tied, thus keeping the cut surface doubled on itself. A similar stitch is then put into the lower side, one stitch on each side being usually sufficient. In this way the incision, which was originally longitudinal, has become transverse, although in two halves.

Intra-uterine Stems.—I have said little of intra-uterine stems in the treatment of ante flexion, for two sufficiently good reasons: 1st. The cases are very rare in which, with judicious management, they are required, and when the flexion is such that a stem is indicated, it will be found in practice that the chances are about equal between success and failure from its use. 2nd. The risks incurred during the time a stem is worn, and the constant supervision required from the medical attendant, added to the carelessness of patients, which often cannot be prevented, render the use of an intra-uterine stem hazardous.

*I never employ intra-uterine stems in my own practice.** Should the practitioner use a stem he should always accompany its application with the

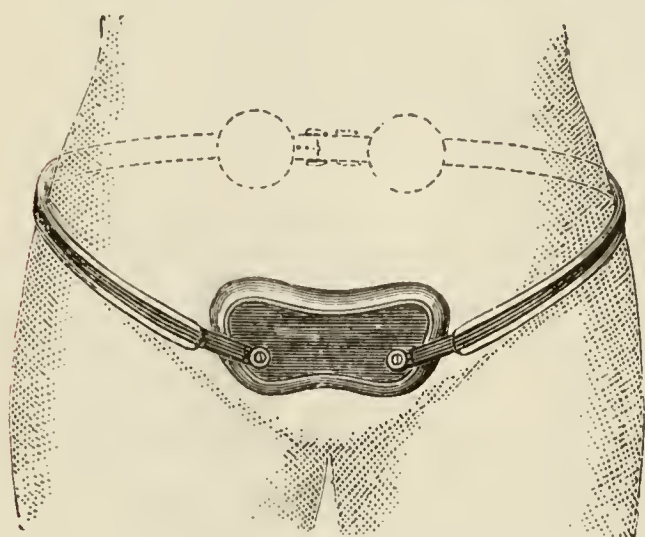


FIG. 168.—SUPRA-PUBIC SUPPORT.
(MATTHEWS BROS.)

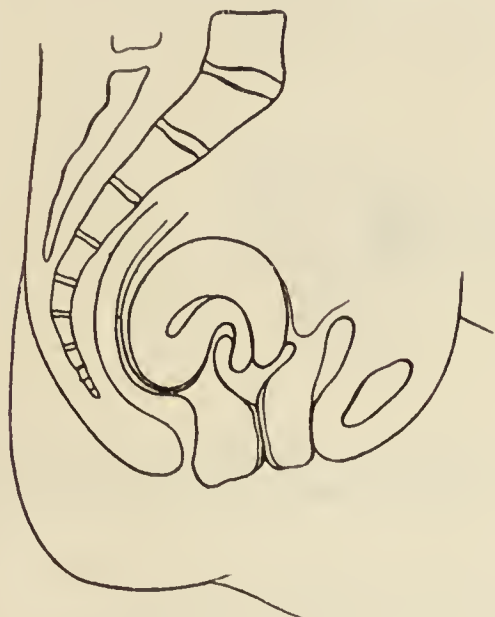
Consisting of two light springs and front and back pads; the front-supporting pad or pads are filled with air, the quantity of which is regulated by a little valve. The shape of the springs and general arrangement of the pads give a good upward and backward support, with a very soft resilient but firm air pressure. The support is very light and cool, and occupies little space, and is adjusted in a very few moments.

intra-uterine stem with external perineal strap and support. (f) The stem should not reach the fundus of the uterus.

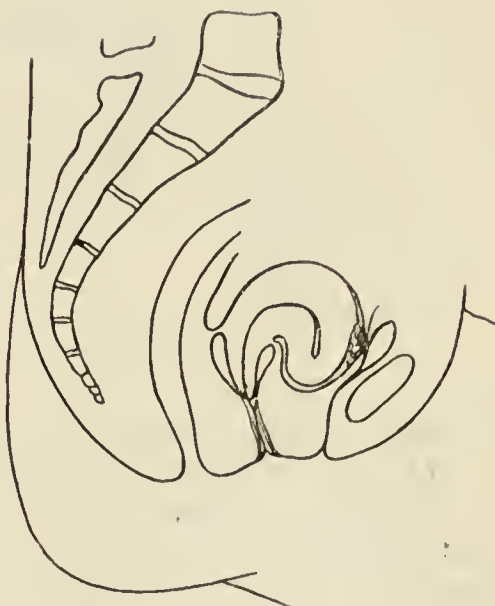
strictest injunctions to the patient regarding rest and medical supervision. The precautions to be adopted if an intra-uterine stem be used in ante flexion are these: (a) Never place a stem in the uterus immediately before a menstrual period; and, when one is worn, remove it on the approach of a period. (b) Always teach the patient how to remove the instrument by means of a string attached to the lower end of the stem, and direct her to do so on the least indication of uneasiness, the occurrence of pain, any chilliness, or feeling of general malaise. (c) Never place a stem in the uterus if there should be signs of past or present perimetritis, or during an inflammatory state of the endometrium. (d) When possible, use a smooth, straight, or slightly curved stem, such as that made of celluloid or vulcanite. (e) Never use an

* This statement must be qualified by the exception of the occasional use of my celluloid stem after operation for stenosis.

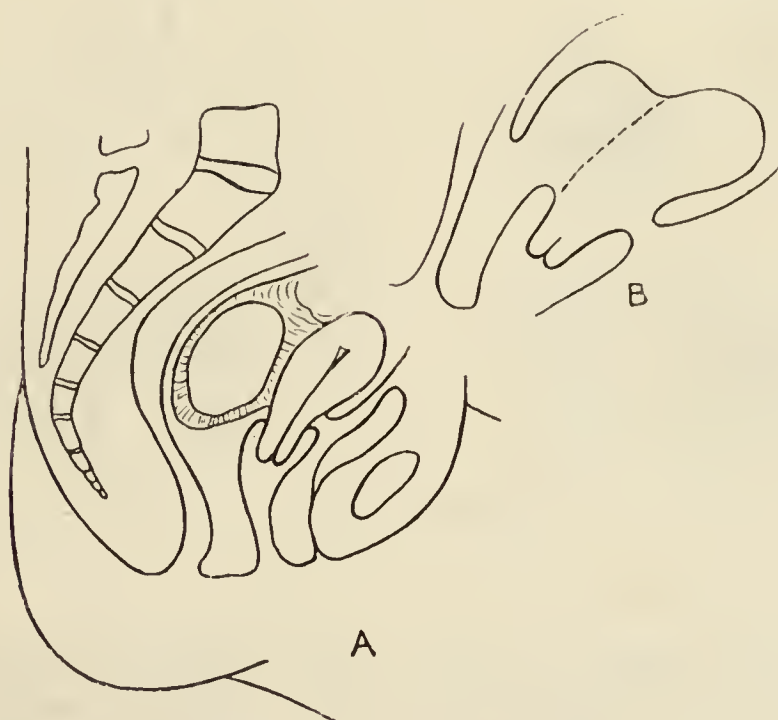
These diagrammatic figures represent (so far as is possible) the positions of the pessaries used by the author in various displacements. They also show certain pathological complications which, when present, contra-indicate the use of a pessary, and which are not discoverable without a careful examination, generally under anæsthesia.



1. Large retroflexed uterus, obliterating the pouch of Douglas, pressing on the rectum and drawing the fundus of the bladder backwards. A typical case for an Alexander-Adams operation or ventro-suspension. (H. M.-J.)



2. Anteфлекed uterus with elongated cervix pressing on the bladder, drawing on the rectum and altering the position of the pouch of Douglas; ovary prolapsed in front in utero-vesical space. (H. M.-J.)

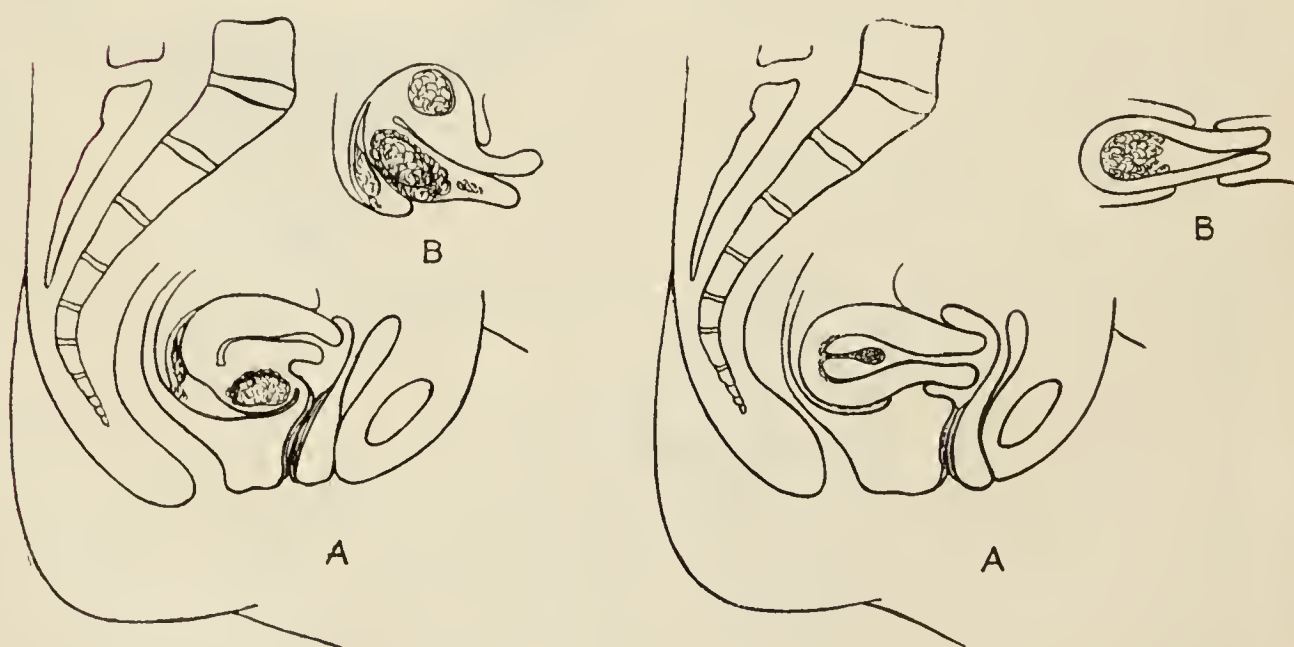


3. **A.** Pouch of Douglas, occupied by large pyo-salpinx adherent to the uterus or incorporated with it and altering its position; may be mistaken for reflexion, a myoma, an ectopic sac, an ovarian cyst, a tumour of the meso-salpinx, or Fallopian tube, or a rectal tumour.
B. Gives an idea of the nature of the tumour examined bimanually, when it is likely to be mistaken for a myoma. (H. M.-J.)

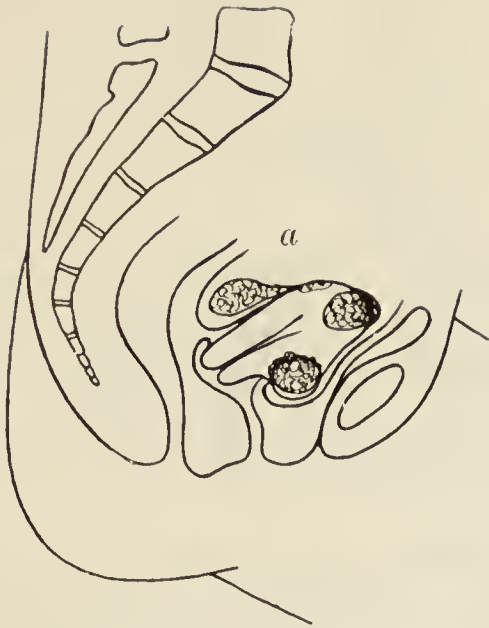
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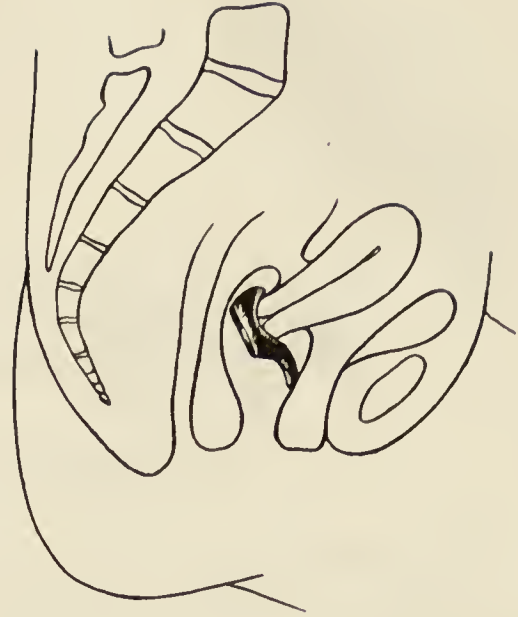
4. **A.** Large uterus encroaching on the bladder, which is elongated as the result of pressure and overdistension--Loaded rectum pressing on the adnexa in the pouch of Douglas.
B. Galabin's pessary supporting the uterus.
C. Galabin's pessary supporting the uterus with myoma in anterior wall.
 (H. M.-J.)



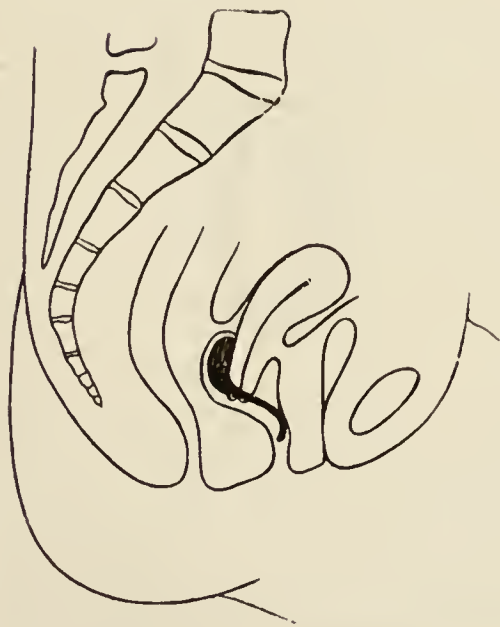
- 5 **A.** Myoma in the posterior wall of retroflexed uterus--Ovary and tube in the pouch of Douglas.
B. Myomatous anteflexed uterus which has become retroverted.
 (H. M.-J.)
6. **A.** Complete retroversion with pediculated polypus growing from fundus occupying the pouch of Douglas, rectum encroached upon and the bladder drawn upwards and backwards.
B. Same uterus with fungoid or carcinomatous mass in the fundus.
 (H. M.-J.)



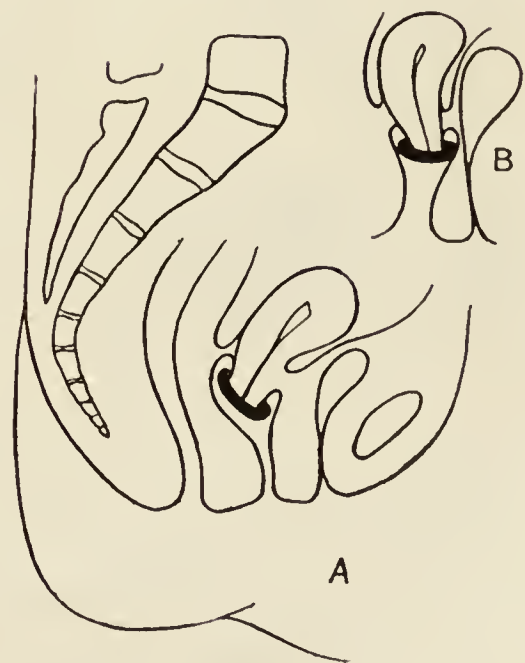
7. Myomatous uterus nucleus in anterior wall pressing on bladder—Pediculated tumour (*a*) in the pouch of Douglas—Myoma or ovarian solid tumour. (H. M.-J.)



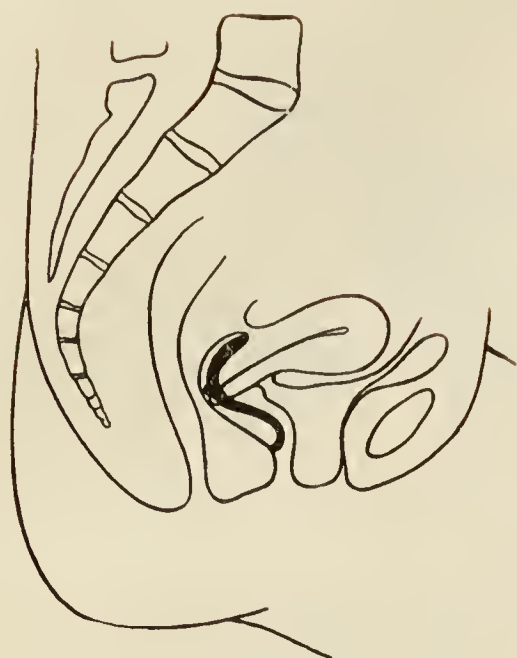
8. Fowler's cradle pessary in position. (H. M.-J.)



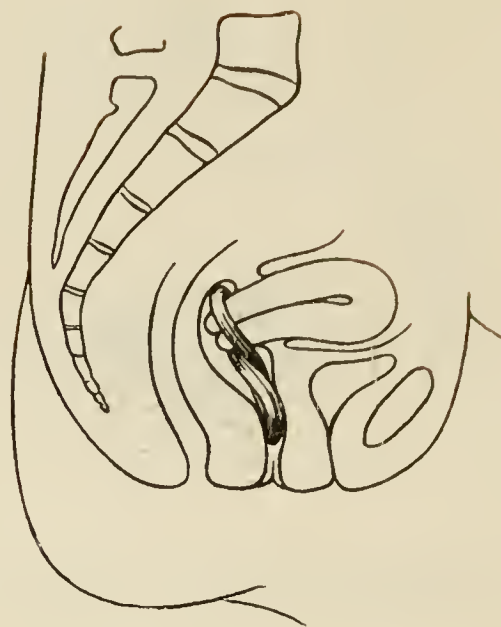
9. Smith - Hodge shaped celluloid cushion pessary in position. (H. M.-J.)



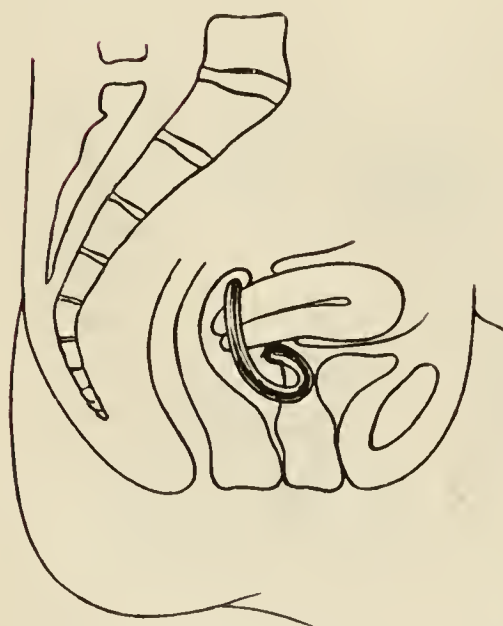
10. A. Glycerine ring in position: uterus has been replaced, but not in normal position.
B. Effect on same uterus of an overdistended bladder. (H. M.-J.)



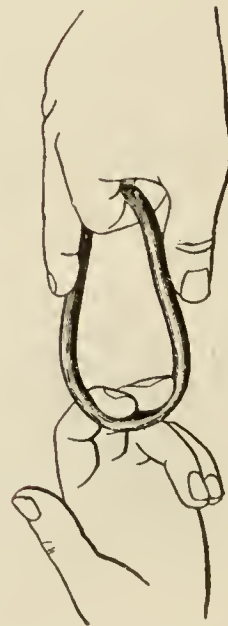
11. Uterus restored to the normal position—**S** pessary applied (curve given by author). (H. M.-J.)



12. Schultze's figure-of-eight pessary applied.* (H. M.-J.)



13. Schultze's sledge-shaped pessary applied.* (H. M.-J.)



14. Method of moulding a Schultze's ring into a figure-of-eight pessary. (H. M.-J.)

* 12, 13 and 14 are after Schultze.

CHAPTER XII.

UTERINE DISPLACEMENTS (continued).

Retroversion and Retroflexion.*

By retroversion we understand a displacement of the fundus uteri backwards, so that it lies towards, or on, the rectum, while the cervix uteri is directed forwards towards the pubes. This inclination occurs in varying degrees, from a slight backward version to an extreme displacement, in which the os uteri is thrown upwards and forwards, and the body of the womb downwards and backwards. I am not here referring to the retroversion of pregnancy.

Schultze puts this plainly when he says, 'Any uterus that is prevented from taking up the position that is normal to it, when the bladder is full or empty, must be looked upon as displaced.' And, again, 'that any uterus, the axis of which, even when the bladder is empty, makes with and behind the axis of the pelvic inlet a stable angle opening outwards, must be described as retroverted.' And when, with this diversion, we have a change in the form of the uterus, marked by a curve in the uterine outline with the concavity posteriorly, the state is regarded as a backward displacement with retroflexion. Retroversion, however, as we know, may occur with an ante-flexion, as anteversion occurs with a retroflexion. Such flexions we may regard as either physiological or pathological. The former, as Schultze well insists, are but the temporary consequences of pressure exerted on the normal flexible tissues of the uterus; the latter are permanent, and due to inflammatory processes, or congenital and infantile conditions, whether arising intrinsically in the tissues of the uterus, or exerting their influence from without, through abnormalities in the uterine supports, or inflammatory conditions causing adhesions, contractions, and so forth.

We clearly distinguish between the terms 'retro-position' or 'retro-deviation,' and 'retroversion with flexion,' the former being such altered position, with possible alteration of form as may occur as the consequence of pressure exerted temporarily on certain points in the axis of movement of the uterus. This, then, is the sole condition that we are considering, and in doing so we have simply to

* See chap. i., 'Anatomical and Clinical.'

keep in our mind a movable line or axis lying at an angle to the conjugate diameters of the inlet and cavity of the pelvis, determined by, and varying according to, the degree of distension of the bladder in front, or the lower portion of the rectum posteriorly, influenced also by the movements of respiration and pressure from above of the abdominal muscles and the intestines. It may help us also if we imagine the uterus as a lever, the longer arm of which is above, and the fulcrum at the utero-vesical bond of connection. Should the bladder be empty, the plane of this axis will lie almost horizontally between the coccyx and the upper border of the pubes, retreating upwards in proportion as the bladder is distended, until it passes behind the axis of the inlet, becoming thus retroposed, and, if coincidentally pressure from behind be exerted through the distended rectum on the cervix, this retro-position becomes more decided, so that the axis of the uterus lies somewhere between the body of the second sacral vertebra and the centre of the outlet.

We remember that such physiological movements occur about an axis, determined by the attachments of the uterus, situated at the junction of the cervix with the body of the uterus. Obviously the resultant of any forces acting above or below this axis, whether anteriorly or posteriorly, will move in opposite directions, pressure on the cervix behind raising the fundus, and on the fundus posteriorly, raising the cervix. So far, this is physiological, and given a normal uterus with normal attachments and play of movement, and healthy muscular and ligamentous controlling and supporting structures, the womb can, and does, right itself from temporary displacements consequent upon the varying yet natural conditions under which it is placed, in the inevitable round of functions discharged by the surrounding, and superimposed organs.

Schultze himself divides the anatomical conditions causing displacement of the fundus backwards, with or without flexion, under five heads:—

- (a) Puerile uterus, with short vagina, or senile atrophy.
- (b) Anterior fixation of the cervix.
- (c) High fixation posteriorly of the cervix, with shortening of one of the folds of Douglas.
- (d) Shrinking of the posterior, or lengthening of the anterior, uterine wall.
- (e) Relaxation of the uterine attachments, this including more especially the folds of Douglas and the round ligaments.

Causation.—Everything that tends to relax the uterine supports, increase the size and weight of the uterus, weaken the uterine wall, soften and congest the tissues, diminish the natural pelvic supports

of the uterus inferiorly and posteriorly, or draw the uterus backward by adhesion, may be included under the heading of causation. We thus find retroflexion frequently associated with pregnancy, laceration of the cervix, subinvolution, uterine fibroids, metritis and endometritis, rectocele, atonic or prolapsed vaginal wall, ruptured perineum, adhesions, sedentary and standing occupations, neglect of the bladder. It is met with oftener in married women, and those who have borne children, than in the nulliparous. This we might anticipate from the occurrence of chronic hyperplasia, and laceration of the cervix and perineum, as frequent consequences of labour. In women who have had several pregnancies and severe labours, we find these results complicated by atonic and relaxed, if not prolapsing, vaginal walls. These likewise predispose to retroversion. It is sometimes encouraged, if not produced, by unnecessary compression of the abdomen after labour, and the fashionable corset is not to be overlooked as an occasional adjunct in the causation of retro-deviation.

Tumours.—Other causes of retroversion are *tumours*, whether of the ovaries, in the broad ligaments, or of the bladder, which may push the uterus backwards, but here it is a case rather of retro-position of the entire uterus than true retroversion, which, if it be present, is more frequently the result of associated adhesions occurring posterior to the uterus. Differences of opinion have, and do, exist as to the causal relation between retroflexion and ovarian tumour. Schultze's view is rather in the direction of retroflexion favouring the growth of the ovarian tumour, and that generally a backward displacement has existed previous to the occurrence of the ovarian growth. That they are often co-existent conditions is proved.

I have spoken of simple backward displacement, but we do not forget that such malposition may, as has been pointed out by Klob, Veit, and Schultze, be attended by a *twisting of the uterus* to the right or left side, according to the situation of the source of contraction, whether in the broad ligament or a fold of Douglas of either side.

Influence on the Ovaries.—With such movements of the uterus we understand how the position of the ovaries must be correspondingly altered. Just in proportion as the uterus is retroposed, so there is the tendency for the ovaries to lie out of their normal position. But, as Schultze points out, provision against backward gravitation of the ovary is made by the relaxation of the ligamentum

ovarîi, and the suspensory ligament of the ovary. However, as we know clinically, it is not uncommon to find, in cases of retroversion and retroflexion, either one or both ovaries lying in the pouch of Douglas, and experience proves how frequently such backward pro-lapse of an ovary accompanies a retroversion; further, how inflammatory states of the adnexa, tubal and ovarian, are constantly met with as complications. These, of course, are usually the sequences of metritic and perimetritic inflammation, and have, as their most unfortunate attendants, adnexal adhesions and peritoneal contractions.

Congenital Anomalies as Causes.—Apart from all such acquired causes of this condition, there are those congenital forms with or without other anomalies, either in the uterus itself, such as elongation of the cervix, undue proportion in the length of the anterior wall, at times associated with vaginal or other departures from the normal in the genitalia. Such slight congenital flexions rarely in themselves give rise to more serious troubles than dysmenorrhœa and sterility.

We must also bear in mind that pelvic inflammations, whether seriously involving the adnexa or not, leave in their wake plastic exudations and peritoneal contractions. Seeing the consequences during and after convalescence of such inflammatory processes, I think we may admit that we are too apt to rest content with their immediate control and the recovery of the patient, without the needful rectification of the sequelæ of the attack. Warm douchings, massage of rectum and vagina, more prolonged rest, avoiding the dorsal position, the use of a suitable soft support, and the administration of such drugs as are calculated to promote absorption of the effused products, and, finally, cold lavements, are some of the means which we may adopt. It is in such cases, when complicated with retroflexion, that the treatment associated with the name of Schultze is of such value. Though great benefit may be derived from a course of waters or baths at Woodhall Spa, Kreuznach, or Salso-Maggiore, in the absorption of pelvic effusions, adnexal thickenings, and enlargements of the uterus, it is not prudent to buoy up patients with too strong hopes of the effects of these waters and spas.

Symptomatology.—With such an etiological and pathological summary before us, we clinically divide backward displacements into those in which the uterus is reducible and movable, with or without complications, and those in which the uterus is adherent and irreducible, and where adnexal complications, not necessarily

but generally, are co-existent. And such clinical division, if it be somewhat general and wanting in accurate differentiation of causes, has its special practical value in its bearing on treatment in regard to those cases which do, and those which do not, demand operative interference.

The evidences of retroversion are pelvic discomfort, rectal and bladder pressure, distress in standing or walking, pain in the back and during defæcation. The gravity of the symptoms arising from retroversion or retroflexion has no definite relationship to the extent or severity of the displacement. We find the symptoms aggravated in mild cases, and at times almost absent in those in which we would expect to find considerable distress. Should an acute retroversion occur, which is rare, the immediate consequences are

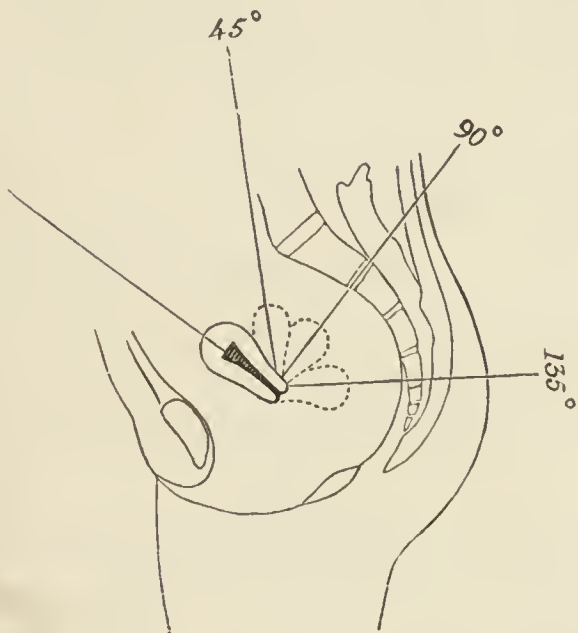


FIG. 169.—DEGREES OF RETROVERSION.
(SCHROEDER.)

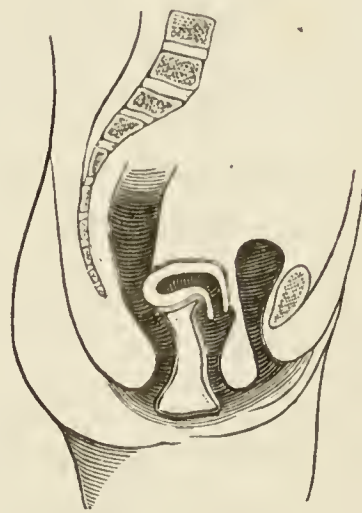


FIG. 170.—RETROFLEXION.
(FROM SCHROEDER.)

generally very severe. Great pain, tendency to collapse, and inability to stand, are amongst the most prominent. When retroversion has existed for some time, symptoms arise which are the secondary consequences of the pathological changes induced by the continued pressure on the rectum and bladder: dysmenorrhœa, menorrhagia, sterility, cystitis, and rectitis. Should conception occur and the womb be retroverted, or should it be displaced during the early weeks of pregnancy, it is not unusual for the patient to abort from the third to the fourth month, when the uterus enlarges and the irritation and distress increase.

Some there are who would make light of the sufferings and the consequences which follow in the wake of true displacements. This is not my experience, and from every point of view I refuse to regard a woman as

healthy who has a retroverted uterus. Psychologists have proved, side by side with gynæcologists, the correlation there exists between displacements and certain mental states, which have completely disappeared with rectification of the error of position, and alienists now universally acknowledge the practical importance of its treatment in the insane.

Diagnosis.—By a digital examination we detect the cervix uteri directed towards the symphysis pubis, and the fundus resting on the rectum. These signs at once indicate retroversion. In the diagnosis of adnexal complications and adhesions anæsthesia is a most valuable aid in doubtful cases. The extent of the fundal tumour, felt posteriorly, affords a rough measure of the degree of displacement. The combined method of examination, and the use of the uterine sound, will clear up any doubt. Before we pass the sound, we must remember that pregnancy and retroversion are not uncommonly co-existent. *It is not to be employed until we can satisfy ourselves that the woman is not pregnant.* We have to beware of the error of mistaking a fibroid tumour in the posterior wall of the uterus, a hæmatocele, an effusion (either cellular or intra-peritoneal) for the retroverted or retroflexed uterus. The history of the case, the conjoined examination, the uterine sound, and reposition of the uterus, should prevent this error. Concretions in the rectum, perimetric effusions, and more frequently interstitial fibroids, are often mistaken for retroversion.

Prophylaxis.—In dealing with the prophylaxis of backward displacement, any reference to anticipatory and preventive measures must necessarily be a very condensed and concise one. We will take them somewhat in the order in which I have referred to the causes of the condition. First in importance is attention to distention and over-distention of the bladder. Women, for various and obvious reasons, are apt to neglect such distention, and to habituate themselves to its occurrence, resisting the natural demand for relief more than men.

The most important caution that can be given to a woman who has to wear a support is *to empty the bladder at regular intervals.* It were well that a like caution were given to all women after a recent labour. Certainly it may be asserted, considering the great importance of the matter, that women generally are not made sufficiently alive to the dangerous consequences which follow over-distention. *Constipation and costive bowels* are only of secondary importance to the bladder. To prevent rectal overloading, to maintain the tone of the sphincters, to cure hæmorrhoidal conditions, to prevent

straining in defæcation, are here our principal indications. I do not speak of affections of either bowel or bladder that may demand special interference for their cure.

Attention to the uterus after labour, especially during the first and second months, has certainly not been given as it ought to have been. Considering that by far the largest proportion of cases of backward displacement are due to post-partum effects, this must be acknowledged.

Flaischlen,* of Berlin, insists on the importance of treatment after child-bed, and that if there be, notwithstanding reposition, recurrent retroflexion, a pessary should be worn for six months.† Nicholson,‡ of Pennsylvania, in a recent article, quotes Rissman upon the cure and prevention of displacements in the puerperium. Rissman cites Ahlfelds and Fritsch, that we should ascertain the position of the uterus at the end of the first week, and, if it be required, that a pessary should be inserted, and he instances cases in which cure of the retroposition followed this treatment, while the patients were kept as much as possible on the side. Many other authorities are in favour of the introduction of a support at the end of a third week, and Rissman lays special stress on the lateral position with the occasional assumption of the prone position.

Whatever view we may hold with regard to these suggestions, I think it is undoubted that the time has arrived for the recognition of the great importance of attention to the position of the uterus during the puerperal month, attention to the involution of the uterus by means taken to secure it, and thorough rectification of any perineal deficiencies. 'Indeed,' says Flaischlen, 'the chief contingent of all mobile retroflexions are those puerperal ones which are not submitted to medical advice for months, or even years, after their origin.' I cannot enter into the consequences of retroversion on the gravid uterus, its effects in abortion and incarceration. When detected, early reposition and the use of a pessary is the obvious course to pursue. Doubtless auto-reposition, with the advance of pregnancy, does happen, but it is not well to rely on it, and reposition under narcosis, properly conducted, should be carried out (see p. 70).

Treatment of Retrodisplacements.—We now approach the actual treatment of a retroverted or retroflexed uterus which is movable and reducible. In all efforts to effect reposition, it is best to place the patient in the semi-prone position. If there be still difficulty, the woman should be put in the knee-pectoral position, her chest being brought well down on the couch, and advantage taken, at the moment of reposition, of a strong expiratory effort on the part of

* *Zeit. f. Geburt. und Gynæk.*

† Rissman, *Munch. Med. Wochen.*, March 6, 1900.

‡ Paper by W. R. Nicholson, M.D., 'Digest of Recent Literature, with a special reference to Uterine Displacements.' *Univ. Med. Magazine*, Pennsylvania, Feb., 1901.

the patient. In some cases counter-pressure may be made in the dorsal position, between the hand on the abdomen, pressing down the cervix, and the fingers of the other hand, in the vagina, which elevate the fundus. *In all these manipulations the bladder and rectum should be empty.* Sometimes the retroverted uterus is congested, tender, and sensitive. In such a case it may be well to combine periodical reposition by the fingers, or an extra-uterine reposer, with occasional depletion, the use of the hot douche, and the intro-

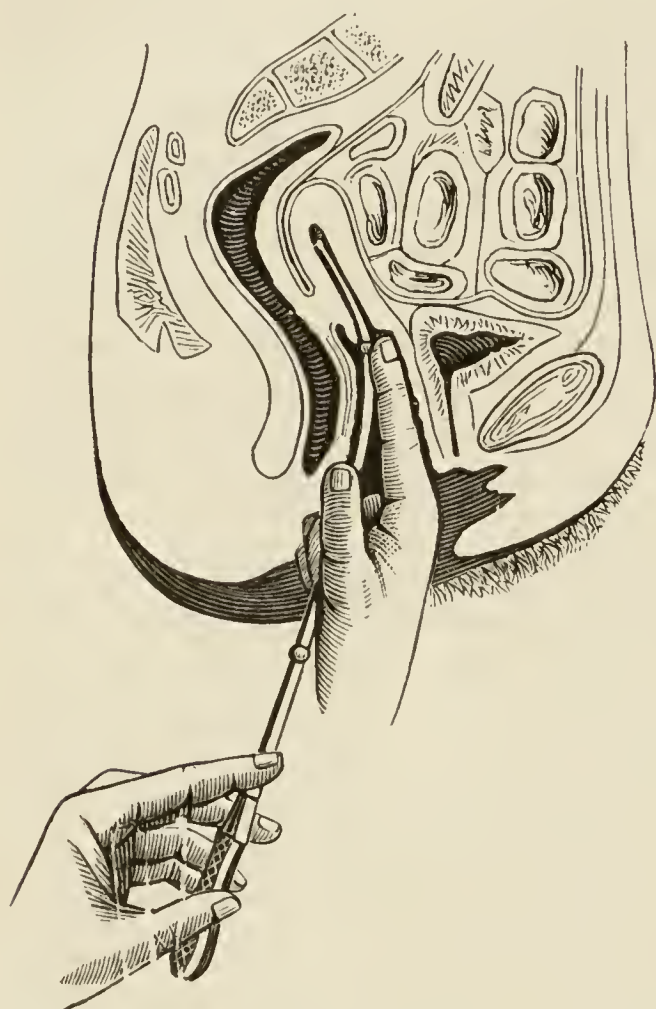


FIG. 171.—INTRODUCTION OF SOUND BEFORE ROTATION. (HART AND BARBOUR.)

duction of a glycerine plug at night, before we permanently replace the uterus and apply a pessary. But this necessity is rare, and, when it is practicable to do so without much force, the uterus should be restored to its normal position, and a pessary be adapted to the size of the vagina and the cervical development of the uterus.

The best reposer is the finger, and if it fail, the uterine sound. This, used with delicacy and caution, is the safest, most effectual, and the simplest intra-uterine instrument for surgeons. To replace the uterus, we use the semi-prone or knee-elbow position ; * carrying the index and middle fingers of the left hand into the vagina, and resting these against the uterus, we press the fundus steadily forwards. Should this not rectify the displacement, we may place the index and middle fingers of the right hand against the cervix anteriorly, and press it backwards towards the sacrum. At the same time pressure is made on the fundus by a finger in the rectum. We often thus succeed in reducing by the fingers a retroverted uterus. This plan should be tried before we use the sound as a reposer.

We can exert greater power with the fingers introduced into the rectum, directing the pressure against the fundus, while the woman

duction of a glycerine plug at night, before we permanently replace the uterus and apply a pessary. But this necessity is rare, and, when it is practicable to do so without much force, the uterus should be restored to its normal position, and a pessary be adapted to the size of the vagina and the cervical development of the uterus.

The best reposer is the finger, and if it fail, the uterine sound. This, used with delicacy and caution, is the safest, most effectual, and the simplest intra-uterine instrument for surgeons. To replace the uterus, we use the semi-prone or knee-elbow position ; * carrying the index and middle fingers of the left hand into the vagina, and

* Page 254.

is in the knee-elbow posture. I have never seen harm accrue from judicious attempts to replace the uterus with the sound. The author's extra-uterine repositor, or elevator, will be found a useful instrument, more especially when pregnancy complicates the retroversion (Fig. 56).*

Having introduced the sound, the roughened face of the handle being directed backwards, the operator takes it lightly in the left hand, and carries it, with a gentle sweep, upwards and forwards to the right, while the handle is made to describe a semicircle, and the intra-uterine portion of the sound is thus gently rotated; finally the handle is carried well back to the perineum. That the uterus may, through the presence of adhesions, resist all attempts at reposition, is not to be

forgotten. To an experienced hand the degree of resistance, both to finger and sound, indicative of such an impediment is readily discernible, but this is not so in the case of the inexperienced, and therefore all the more care must be exercised by beginners in using the sound for the purpose of replacement.

When the os uteri is directed far forwards we may not be able to introduce the sound in this manner. The handle may have to be directed anteriorly under the pubes, and, when introduced, the fundus must be first partially raised by pressing on the centre of the sound with the finger of the right hand, before the rotatory sweep is made with the left. *The sound is not to be introduced and simply rotated on its axis.*

Should a flexion complicate the displacement, the sound must be curved according to the degree of flexion. We may not be able to

* See pages 70-73 for description of the repositor, and directions for the use of the uterine sound.

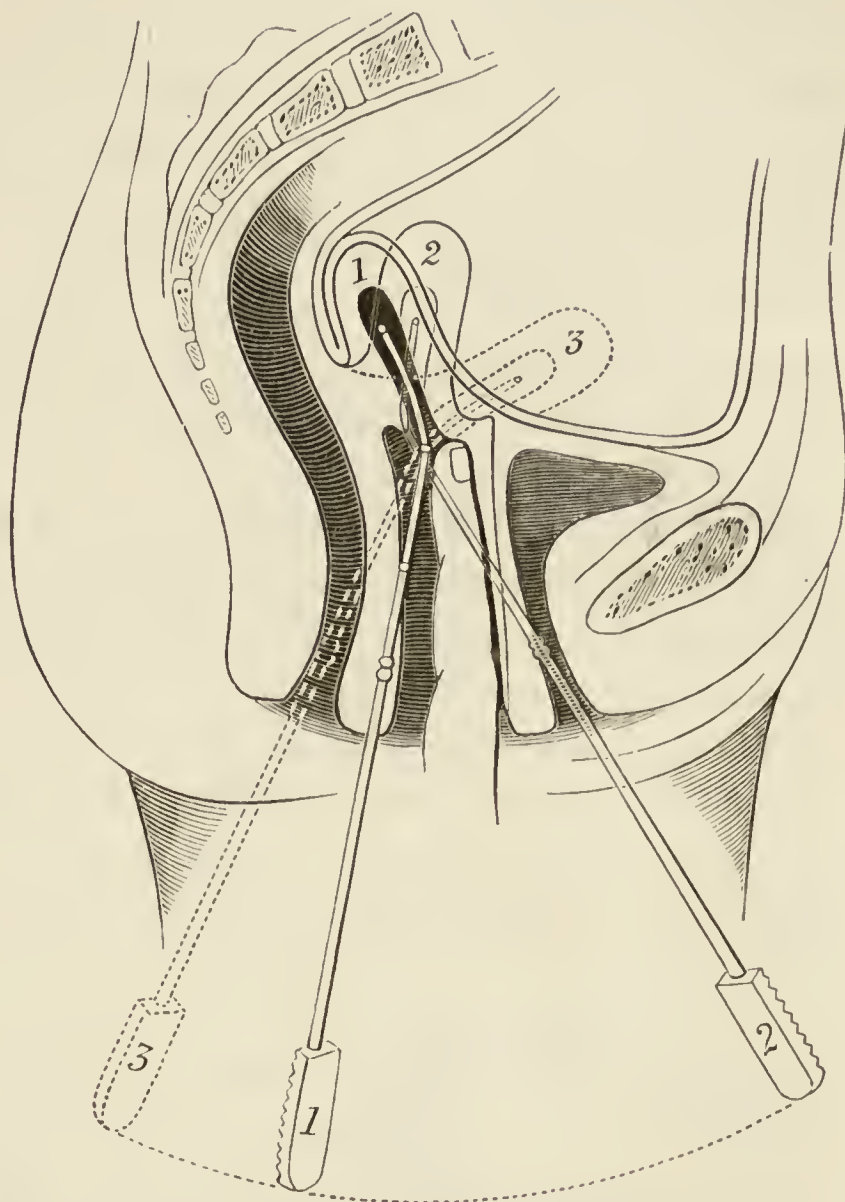


FIG. 172.—ROTATION OF SOUND IN RETROVERSION—
SHEWING THE SWEEP GIVEN TO THE HANDLE.
(ADAPTED FROM HART AND BARBOUR.)

straighten the uterus. The same caution must be exercised, and the same means adopted, as in the case of ante flexion. Any previous inflammatory condition has to be controlled. The uterus may be partially straightened by the uterine sound, or still more so by conjoined recto-vaginal manipulation, the index and middle fingers of the right hand in the vagina pressing the cervix downwards and backwards, while the same fingers of the left in the rectum press the fundus steadily upwards and forwards. The manœuvre is best effected in the knee-elbow position. *The sound requires, in its use, gentleness and patience.* The ill effects attributed to it are generally the consequences of ill-advised and unjustifiable force, or of its introduction at improper times.

In the treatment of retroversion, judicious and patient manipulation of the uterus by the postural method, careful reposition by means of the sound, and contemporaneous adjustment of a suitable pessary will in the majority of cases obviate the need for operative interference.

When we have succeeded in replacing the womb, our next object is to retain it in its normal position, and a pessary of the proper size is selected and introduced. This should be worn constantly for some time. I have had more *permanent* satisfactory results with Fowler's pessary than with any other. This statement refers to cases in which we find that the Hodge or ring is not sufficient to support the fundus. After a few months it can be replaced by a suitable lever Hodge, with or without a pad, or possibly a glycerine ring.*

There can be no doubt that the pessary which is capable of adaptation to most cases of retroversion is the lever-pessary of Hodge.

'As its name indicates,' says Goodell, 'this pessary acts on the principle of a lever; but the mechanism of its action is twofold. By stretching the vagina upward and backward, it draws the cervix in the same direction. The womb then turns on its central point of ligamentous attachment as on a fixed pivot, and the fundus is consequently tilted forwards. The womb itself thus becomes a lever, of which its point of attachment to the bladder is the fulcrum. The power is applied to the cervix, and the fundus becomes

* Larger sizes of Fowler's cradle pessary than those usually sold are made by Arnold. They are required in old-standing cases of retroversion with vaginal prolapse. In all cases in which there is tenderness and sensitiveness, it is well to prepare the patient by the application, three times in a week, of an antiseptic tampon of salicylic or boric acid wool soaked in glycerine, which is pressed up into the posterior fornix of the vagina, so as to push forwards the fundus; while by a second tampon, applied below and in front of the cervix, this latter is pushed back; the superior plug is thus assisted in its action on the fundus. Both plugs are finally retained in position by a roll of antiseptic wool passed into the vagina. In a large number of cases, however, the pessary should be moulded at the time from the celluloid ring, to the shape most suitable.

the weight, or resistance. This action remedies retroversion, but not retroflexion, unless complicated with retroversion, as it usually is. The anterior vaginal wall, with the visceral pressure above it, now becomes the power applied to the lower limb, or "long arm," of the lever; the posterior vaginal wall is the fulcrum, or support; and the upper limb, or short arm, lying behind the cervix, directly pushes the weight or fundus uteri. This action tends to remedy both retroflexion and retroversion. For instance, during the act of inspiration the descending diaphragm crowds down the abdominal viscera upon the bladder, to which are attached the cervix uteri and the anterior wall of the vagina. These organs, therefore, descend. As a result, the lower or fore end of the lever is necessarily pushed down by the descending anterior wall of the vagina, on which it rests, while its upper or hind end proportionately rises up and tilts forward the retroverted or the retroflexed fundus. In expiration, the reverse takes place. The pressure is, therefore, not a steady, but a gentle rocking one, which is the most efficient of all. This, also, is one least liable to inflict injury on the soft parts, because the points of pressure are varying ones. But to attain these ends the pessary must be mobile, *and never so long as to put the vagina on the stretch; otherwise it loses its distinctive character of a lever, and degenerates into an ordinary ring pessary. It should further impinge on the soft parts only, and take no bearings on the solid structure of the pelvis. . . .*

The Smith-Hodge pessary, with the cushion full of glycerine, and of the shape shown in Fig. 174, is a useful pessary in those cases



FIG. 173.—THOMAS'S MODIFIED
SMITH-HODGE.

To be had in celluloid.

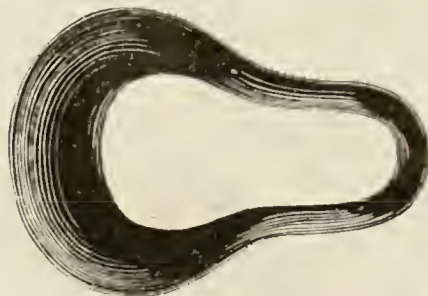


FIG. 174.—ARNOLD'S GLYCERINE
PAD.

in which there is a sensitive fundus or ovary. Similar pessaries are made with the cushion filled with air. These pessaries are not durable. They are, moreover, apt to lose their shape.

To introduce Hodge's pessary, bring the woman, on her back, or in the semi-prone position, over the edge of the couch or bed, with the knees well drawn up. The pessary is now taken in the right hand, while the labia are held lightly apart with the fingers of the left, at the same time that the perineum is pressed in a downward direction. The pessary, with its uterine or longer end in a line with the vulvar orifice, is now passed into the vagina, the principal pressure being directed on the perineum; when the support has

completely passed the vulva, the fingers of the right, or conducting hand, are changed so as to turn the pessary half round on its long axis, thus bringing the concavity of the large curve to point for

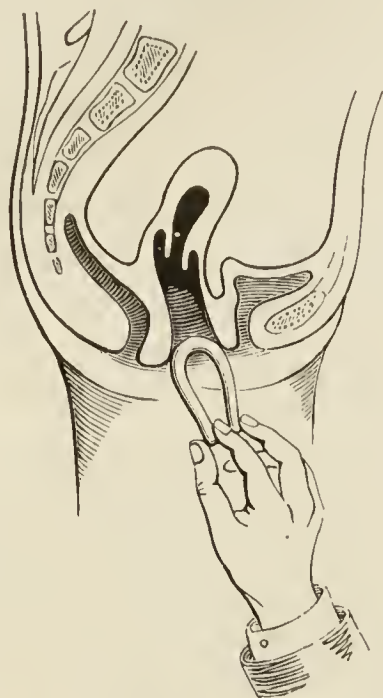


FIG. 175.—FIRST STEP OF INTRODUCTION.

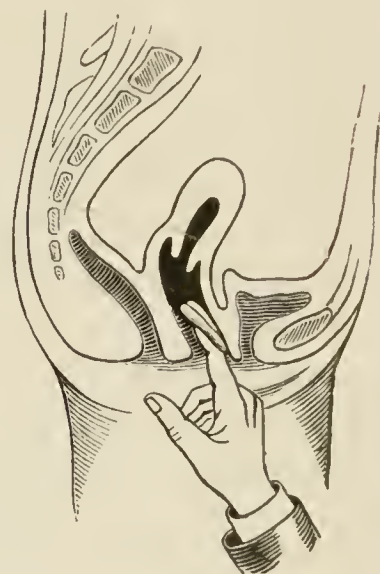


FIG. 176.—SECOND STEP OF INTRODUCTION.

wards to the interior vaginal wall. This is the moment of greatest pain to the woman, and any bungling in rectifying the position of the pessary, as it lies pressing on the front of the cervix, causes

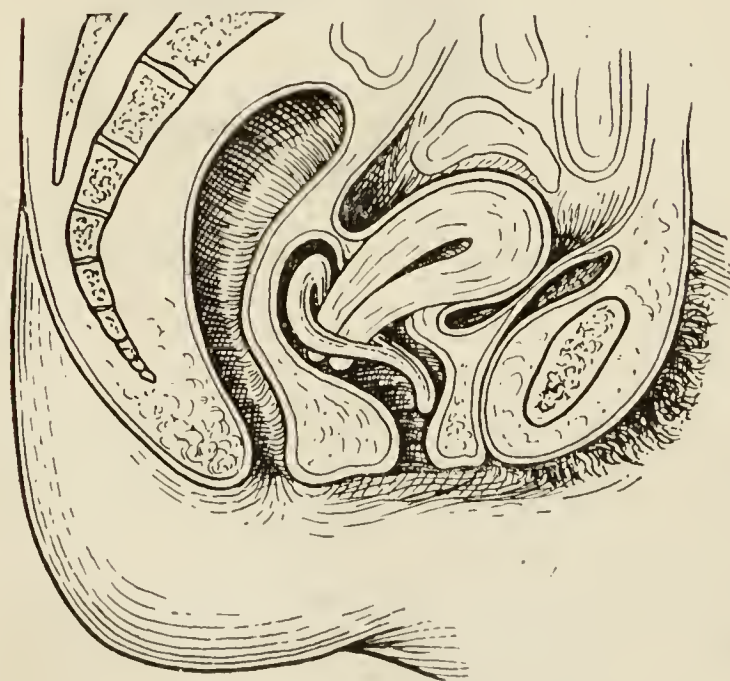


FIG. 177.—SMITH-HODGE PESSARY IN POSITION.

still greater discomfort. The index-finger of the right hand is therefore quickly transferred to the upper bar, which is hooked or pressed down, so as to glide over the cervix into the vaginal cul-de-sac behind. The relation of the pessary to the cervix is ascertained, the degree of tension of the vaginal roof felt, and the exact position of the uterus determined, before we permit the patient to rise. The lower bar presses on the soft

and yielding anterior wall of the vagina, instead of on the pubic bones. It is well always to explain to the patient, or friend, the exact position of the pessary in the passage. If uneasiness should

follow, we should instruct her how to remove it, by pulling, not too forcibly, on the lower bar, and by turning the instrument on its long axis and gently withdrawing it. If a case of retroversion should resist the application of a pessary, the one lesson every prudent practitioner has to learn is patience. By the daily practice of the knee-elbow posture, local measures directed to reduce congestion and inflammation, by habitual reposition, and the education of the vagina and uterus to the presence of a well-fitting pessary, we ultimately conquer.

I cannot speak too strongly of the advantages of keeping ready at hand several sizes of these rings of Schultze's, or those made for me by Messrs.



FIG. 178.—A CELLULOID RING WITH WIRE INSIDE.

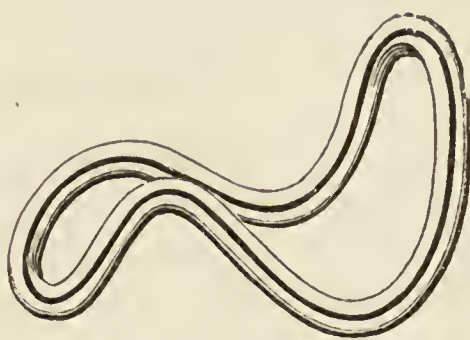


FIG. 179.—SAME FINALLY MOULDED FOR A CASE OF RETROVERSION, SHOWING THE POSTERIOR ARM CURVED TO SUPPORT THE UTERUS.



FIG. 180.—FIRST SHAPE.



FIG. 181.—SECOND SHAPE.

Arnold. Having carefully examined the vaginal roof, and noted the size required, a few rings are taken and thrown into a basin of very hot water; when they are pliable, one is given the shape shown in Fig. 180. The ring is again thrown back into the water for a few seconds, and on being withdrawn it is given the form shown in Fig. 181.

It is again immersed, and after removal the second curve is made (Fig. 182). After a few seconds' final immersion, the pessary may be made to assume the exact shape desired, and the arms of the lever brought to the proper length and angle required (Fig. 179 shape advised).



FIG. 182.—THIRD SHAPE.

The pessary is next thrown into cold water, and left in it for a few minutes to set. The red celluloid rings are not so liable to crack in moulding, and they keep better than the transparent kind.



FIG. 183.—CELLULOID CUSHION PESSARY.

This is a perfect pessary, light, durable, and aseptic. It was made at my desire by Messrs. Arnold.

Massage and Manipulation.

Schultze practises careful stretching, in the lithotomy position, of all adhesions which keep the uterus in its false position. This is done under an anæsthetic, the rectum and bladder having been thoroughly emptied. The rectum is irrigated with warm water. The index and middle finger of the left hand are passed into the rectum, and the thumb of the same hand into the vagina. The other hand is placed on the abdominal wall. Having determined the situation and nature of the adhesions, these are gradually stretched without any tearing, at the same time that the uterus is raised. I have learned from experience that much can be done by manipulation to free recent adhesions. It has been my practice in cases in which I found these interfered with reposition, to place the woman in the knee-elbow posture, and both by rectum and vagina to manipulate the uterus for some days before trying reposition with the uterine sound.*

Retroflexion.

In retroflexion the fundus is bent backwards on the cervix, and lies against the rectum. Retroflexion may be a congenital affection, due to arrest of development of the posterior uterine wall, and may remain undetected even after puberty. In practice, however, we have nearly always to treat that displacement which is secondary or acquired.

Causation.—We may refer to the causes of retroversion when we inquire into those which are productive of retroflexion. It is not difficult to understand how the uterus, still softened and enlarged

* See Fig. 200, Schultze's figure-of-8 pessary.

after pregnancy, with strained and relaxed ligaments, or with the perineal support injured and weakened, may, while in a state of subinvolution, yield to abdominal or pelvic pressure, and bend at the axis of suspension. In those cases in which there is an enlargement in the posterior wall, either as the consequence of congestion or hypertrophy, or an intramural fibroid, we can readily understand the occurrence of retroflexion. The flexion is, as a rule, preceded or attended by version. Contraction of the uterine canal leads to stenosis and obstruction of the menstrual flow, while the consequent congestion of the uterine tissues in the fundus, and the increase of weight, still further encourage the tendency to uterine prolapse and flexion. As in anteflexion, cause and effect react on each other ; the longer the displacement lasts, the larger the uterine fundus becomes, and the more acute the angle of flexion.

Diagnosis.—In examining the retroflexed uterus with the finger, the os uteri, occupying almost the vaginal axis, is at once reached, while the fundus is found as a solid mass, filling the posterior cul-de-sac, a well-defined sulcus separating the cervix from the fundus. The flexion is distinctly traceable with the finger. We confirm the diagnosis by both recto-vaginal and utero-vaginal examination. Carrying the index-finger of the left hand into the rectum, we feel the fundus through the rectal wall, and encroaching on it ; with the finger of the right hand on the cervix, we can draw on the uterus, and so detect the mobility of the tumour and the conjoined movement of the cervix and fundus. It is only in those comparatively rare cases where the uterus is enlarged and fixed by adhesions or recent effusions, that any doubt can exist after a careful vaginal and bimanual examination. To confirm our diagnosis, we pass the uterine sound, but in doing this we must exercise even greater caution than in simple retroversion. The difficulty will depend in a great measure on the degree of flexion. The sound must be well curved, corresponding to the curve of the uterine axis ; the handle is taken lightly in the right hand, with the concavity of the instrument directed forwards. Guided by the finger of the left hand, the knob is introduced as far as the internal os ; by a *tour de maître* the direction of the sound is reversed, the concavity being directed backwards, and the handle carried well forward towards the pubes. Assistance can at the same time be given by raising the fundus with the finger of the left hand in the vagina. In those cases in which the os is directed far forwards and is high in the pelvis, the

sound must be introduced with the concavity turned towards the sacrum.

Treatment.—All that has been said in regard to the management of retroversion applies with equal force to retroflexion. A suitable

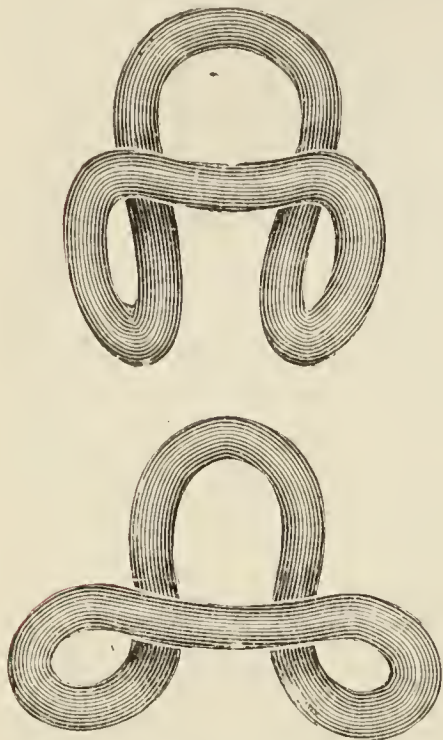


FIG. 184. — SCHULTZE'S
SLEDGE-SHAPED PESSARY
—TWO SHAPES MOULDED
FROM CELLULOID RING.

pessary has to be inserted when the uterus is replaced and the curve rectified. In the retroflexed womb, however, there is the flexion in addition to be corrected. The sound may have to be periodically passed. If an intra-uterine stem be employed, we have to bear in mind all the precautions (p. 244) to be taken both before introducing the stem and during the time it is worn. Schröder advises it to be placed for the first few days in the retroverted uterus, and replacement not to be attempted until it has been thus worn for a little time.

When we have replaced the uterus, we must endeavour to retain it in position by one of the forms of pessary recommended for retroversion—more especially Fowler's cradle pessary, or a Hodge suitably moulded. The question naturally arises, What is to be done to relieve the patient in those unfortunate cases in which rectification of the displacement is impossible, and the retroflexion incurable?

These are the points which are of the greatest importance for practitioners to remember in regard to backward displacements.

1. *In making a diagnosis*, should there be any cause for doubt, have the rectum and bladder emptied, and examine the patient bi-manually, with two fingers in the rectum, by the recto-abdominal, as well as by the vaginal method. The semi-prone position and that of the knee-elbow should also be availed of, as both throw valuable light on the relation of the ovaries to the uterus, as well as on the mobility and size of the uterus and adnexa.

2. *Anæsthesia* is essential for a correct diagnosis in certain cases. In conducting examinations under anæsthesia and manipulations of the adnexa, unnecessary force should be avoided. The possibility of mistaking an enlarged ovary for the uterus must be remembered.

This caution also refers to other tubal and cystic collections in Douglas' pouch. Special care should be taken if the sound be used with an anæsthetic.

3. *The knee-elbow position*, with the empty rectum and bladder, will be found a most valuable aid in replacing the uterus by the bi-manual method. When thus replaced, the pessary selected, one suitable in size and shape, can be inserted, and supported by the finger until the patient is again in the lateral position.

4. *The sound* is useful for estimating the size of the uterus and the degree of flexion ; in the diagnosis of extra-uterine and associated tumours, especially by the vesico-vaginal and recto-vesical methods of examination. It is dangerous as a repositor where there are adhesions, or the results of recent pelvic inflammations. It is not justifiable to use force with the sound in attempts to replace the uterus with it, and should it be employed as a repositor it must not be rotated on its axis, but used to raise the uterus in the proper manner. When the sound has been used for therapeutic purposes, precautions should be taken subsequently, by enjoining the necessity for rest, avoidance of cold or exertion, or other indiscretion on the part of the patient. The sound should always be rendered aseptic before use. The possibility of a retroverted and pregnant womb has always to be borne in mind.

In the great majority of cases the sound is unnecessary for the purpose of diagnosis, and only in a certain proportion of cases is its use demanded as a repositor if the bi-manual method be carefully carried out.

5. **Massage.**—Should massage be indicated, the rectum and bladder ought to be emptied beforehand. It is best administered in the semi-prone and knee-elbow position. The vagina having first been douched out with some antiseptic, and the fingers of the operator lubricated with lysol, the degree of force used must be carefully proportioned and gradually increased in the manipulation of adhesions, according to the sensitiveness and resistance of the uterus, and the relations and condition of the adnexa. The patient being in the knee-elbow position, after the massage the posterior cul-de-sac is packed with ichthyol, glyco-thymolin, and glycerine tampons. (Solution of ichthyol (10 per cent.) one part, glyco-thymolin one part, glycerine three parts.) No pessary should be worn until the uterus is got into as fair a position as possible. It is well for the patient to assume for some minutes, a few times in the day, the knee-elbow posture. All patients under treatment,

and after the uterus has been restored to its normal position, should be directed to empty the bladder at regular intervals.

6. **Curettage.**—The most important step towards the cure of many cases of retroversion, especially those in which some form of endometritis, with enlargement of the uterus, hyperplastic or otherwise, complicates the displacement, is *thorough curettage*. The necessary dilatation of the uterine canal, the reduction of congestion, and the general improvement in the size of the uterus and the state of the adnexa which usually follow a complete curetting, render the restoration of the uterus to its position more easy, facilitate the carrying out of any necessary manipulations, and render the cure more permanent and satisfactory.

7. Displacements that do not yield to such palliative treatment, that pessaries fail to cure, that are complicated with disease of the adnexa, that cause symptoms seriously interfering with the health of the woman, and which prevent her following her avocation, demand operative interference, and such operative interference will be largely influenced in its nature and technique by the associated conditions and the circumstances of the patient.

Operative Treatment.—By prolonged perseverance in treatment, by local absorbents, massage, the assistance of posture, curettage and a pessary, we frequently cure completely cases which at first appeared almost incurable. Recalling, however, the number of those in whom there has been no such satisfactory issue, and the time, suffering, and inconvenience involved, I should now in the first instance advise operation in all extreme cases of retroversion, while an expectant course is altogether out of the question in the instance of poorer patients.

Among the most valuable papers on the subject of operation published within recent years are those of Delagénière,* (Le Mans) and Goldspohn,† of Chicago, International Congress of Gynæcology and Obstetrics, Amsterdam, 1899; June, 1900;‡ Kohn's paper read before the Munich Congress in 1897; a paper by J. Veit,

* 'Du raccourcissement des ligaments larges et des ligaments ronds dans la rétroversion de l'utérus.' Dr. Henri Delagénière. *Comptes Rendus du Congrès Internationale de Gynæcologie et d'Obstetrique*, Amsterdam, 1900.

† Goldspohn, *Amer. Gyn. and Obstet. Jour.*, June, 1900.

‡ 'Indications, Technique, and Results of an Improved Alexander Operation in Aseptic, Adherent, Retroversions of the Uterus, when combined with Inguinal Coeliotomy, *viâ* Dilated Internal Inguinal Ring.' By A. Goldspohn, M.D., Professor of Gynæcology, Chicago, Post Grad. Med. School, etc.

in June, 1900;* and those already referred to of Rissman and Flaischlen (*Zeitschrift f. Chir.*, Bd. LVIII., H. 3 and 4); Mazade (*Zentralb. f. Gyn.*, 1903, No. 26); Martin (*Philadelphia Med. Jour.*, June 15, 1901); Le Roy Broun (*New York Medical Record*, 1902, Feb. 2); Kuhne (*Centralb. f. Gyn.*, 1901, No. I.); Carl Peters, Dresden (*Muench Med. Wochenschrift*, 1900, S. 1163).

Most valuable contributions have also been made by Hohl (*Archiv. f. Gyn.*, 1897); Boralevi ('Annali di Obstetricia e Genecologia,' Sept., 1897); Luigi Negri ('Annali di Obstetricia e Gen.,' 1896); Laphorn Smith (Amer. Gyn. Soc., May, 1897); Müller's Operation (paper by F. Edge, *Brit. Gyn. Jour.*, Aug., 1896); Laphorn Smith (*Amer. Jour., Obstet.*, 1898); Howard Kelly ('Operative Gynæcology,' 1898).

Choice of Operation.

The vital points with regard to operation, once it be determined upon, are: (1) that method most suitable to the mobile and reducible uterus during and after the child-bearing period; (2) that appropriate to retroflexion with adnexal complications and adhesions; (3) the bearing of the particular method on child-bearing, and the consequences which may follow to the parturient woman during labour.

Abroad, either Alexander's or the Alexander-Adams operation, with various and important modifications, extra-peritoneal or intra-peritoneal, is preferred by such well-known gynæcologists as Doléris, Cohn, Kustner, Krönig, Veit, Carl Peters, Delagénère, Bamberger, Stocker, Füth, Rumpf, Kocher, Doyen, and others; in America by quite a number of surgeons, including Goldspohn, Edebohls, Mundé, Martin (Chicago), Le Roy Broun, Parker Newman, and Kellog, while Laphorn Smith, of Montreal, has performed a very large number of operations by this method.

Various Operative Procedures.

To enter into details of the various operative procedures suggested by various surgeons, in no matter how brief a manner, is obviously impossible. I must content myself with a rather imperfect classification, based on the broad principles on which each operation is devised. *The first* are those operations in which the round ligament is fixed, as by the original Alexander-Adams method, to the external abdominal ring, or the aponeurosis of the external oblique muscles, and the various modifications of this operation, some of

* J. Veit, *Berliner Klin. Wochen.*, June 11, 1900.

which mainly consist in further interference with the inguinal canal, either partially or for its entire length, and the mode of fixation of the round ligament, into the processus vaginalis peritonei (Kustner). Or the operation proposed by Goldspohn, in which, after sufficient enlargement, the round ligament is traced to its place in the broad ligament, and the internal inguinal ring stretched and dilated, is utilized for abdominal exploration and manipulations, or, if necessary, removal of diseased structures. Finally, by purse-string sutures, the round ligament, the peritoneum, and inguinal ring are united, the entire structures consisting of the round ligament, with the internal ring, and the surrounding muscular structures of the internal oblique and transversalis muscles, being anchored to Poupart's ligament. There is the operation as practised by Delagénière, Mann, and several others, in which the round ligaments are reached by an abdominal incision, when they are looped or folded upon themselves, and fixed to the line of Poupart's ligament or to the aponeurosis and walls of the canal. Others again include the loop in that which ties off the adnexa when these are removed. Edebohl's opens up the inguinal canal for its entire length, and having shortened the ligaments, anchors the various structures round the internal ring to Poupart's ligament, including in the attachment the external ring and the external oblique aponeurosis. The Landaus fix the broad ligaments to the peritoneum and sub-peritoneal fascia, not the uterus, reserving any fixation of the latter for after the child-bearing period of life. Martin, of Chicago,* following on the suggestion of Fowler to suspend the uterus from the urachus, dissects off a strip of peritoneum half an inch wide and three inches in length from the abdominal wall. The freed uterus is now sutured at the fundus by passing the thread from behind forward, and attaching it with the strip of peritoneum to the peritoneal surface of the abdominal wound above the uterus. A few small catgut sutures also retain the latter in its position.

All these operations, and others of a similar nature, agree in the principle that the uterus shall be held in position by the round ligaments alone, or with the structures with which they are connected in the inguinal canal, and that the point of attachment or suspension be either to the external abdominal ring and aponeurosis or Poupart's ligament.†

In the second class of operations the uterus itself is fixed either

* *Phil. Med. Jour.*, June 15, 1901.

† Quoting from Cohn, Nicholson says:—'It is interesting to note that the operation of shortening the round ligaments was first performed by Alquié, in the year 1840, in order to support a prolapse, and by Aran, who treated a retro-displaced organ in this way. France, however, was not the country in which the merit of the operation was first established, since the procedure was allowed to lapse until many years later, and was then re-introduced elsewhere. In Germany, Langenbeck and Freund were the first advocates, but to Alexander and Adams the real credit belongs. Cohn, from the results of the Breslau clinic, regards the Alexander-Adams as the best form of operation during the period of possible conception.' (*Zeits. f. Geburt. u. Gyn.*, Bd. XLIII., H. 3.)

extra-peritoneally to the vagina, as in the operation of Müller and Dührssen, or by the intra-peritoneal vaginal fixation, by August Martin. There is the method of Vineberg in which vaginal fixation of the round and broad ligaments is secured by anterior colpotomy. *In the third class* we include those operations of fixing the uterus to the abdominal wall, either by the direct mesial-fixation methods of Leopold, Czerny, Pozzi, and others, or the lateral fixations of Olshausen and Sänger, or the *uterine suspension* method of Howard Kelly, by which the uterus is fixed to the peritoneum and sub-peritoneal fascia. The operation of Mackenrodt, in which the uterus is attached to the posterior surface of the bladder, is one which has not been largely adopted.

N. J. Hawley * strongly advocates vesico-fixation from the point of view that the accompanying colpotomy affords ample opportunity of dealing with the adnexa and adhesions, as well as any endometritis that may be present. There is less danger to the patient, speedier recovery, and absence of the abdominal scar. The first steps of the operation are practically A. Martin's anterior colpotomy. When the edge of the bladder is separated from the uterus, it is stitched high up on the anterior surface of the latter, with a single chromicized mattress suture, and the vaginal wound closed over this with interrupted catgut.

Tightening the Broad Ligaments.

Harris Slocum † suggests *the removal of a triangular portion of the broad ligament*, or buttonholing it either through the parovarium on one side, or the broad ligament on the other. 'When the object is simply to correct the backward displacement after adhesions are broken up and the fundus drawn forwards, by making traction on the broad ligaments, it may suffice to shorten the latter by simply making a fold on either side, modifying the extent and shape of this according to circumstances. A V-shaped fold, inverted, if it be desired to raise the uterus as well as the fundus, is recommended. Modifications of the operation will depend upon the necessity for removing the ovaries and oviducts. Should this be necessary, he ligatures the ovarian vessels at the pelvic wall, and then excises the oviduct for its entire length, a V-shaped portion of broad ligament being removed at its outer extremity. The ovaries may be removed through the same incision. The size and direction of the buttonholes, if this plan be adopted, will depend upon circumstances. He suggests calling the operation 'cuneiform shortening of the broad ligaments.'

Shortening of the Sacro-Uterine Ligaments.—Within the last few years prominence has again been given to the treatment of retroversion and retroflexion, as well as prolapse of the uterus, by operation on the utero-sacral folds.

* *Amer. Gyn.*, May, 1903.

† *Ibid.*, July, 1903.

Bovee* has collected the statistics of ninety-one operations, the great majority of which were performed for retroversion. His own operations were performed between the years 1897 and 1902. The idea of treating both retroversion and prolapse of the uterus by operating upon the utero-sacral ligaments commenced with Amussat's first attempts with caustic potash and cautery in 1850. Herrick, Byford, Freund, Formell, Sanger, Wertheim, and Mandl, operated both by the abdominal and vaginal routes. Jessett and Stanmore Bishop revived the principle of the operation in England, the latter more particularly for prolapse, and in cases where the ligaments are lacerated or torn through. His operation is performed through the abdomen. (See 'Prolapsus Uteri.') The details of Bovee's operation, and that of Bishop, will be found under the head of 'Prolapsus Uteri.'

Practically, then, we come to (1) the operation of Alexander, or the Alexander-Adams, with the various modifications of his method, extra-peritoneal and intra-peritoneal; (2) ventro-fixation; (3) suspension of the uterus by Kelly's method, and (4) vagino-fixation. For my own part, operating only in cases in which there are such complications or conditions as absolutely demand interference, I have adopted either ventro-fixation or suspension of the uterus, as I feel that cœliotomy affords the best and safest means of correcting the majority of adnexal complications should they exist, while experience does not appear to have shown, from statistics of the results, that there is greater danger to pregnancy than by any other methods. However, given a case of mobile and reducible uterus, there can be no doubt that the Alexander-Adams operation is on all grounds the classical method of dealing with the condition. The mortality of either uncomplicated operation is practically nil.

Of 1140 operations, the records of which I have gone into, I find but two cases died. Many operators loop intra-peritoneally the round ligaments, as originally advocated by Delag ni re, Mann, and Jacobs, or it is fixed into the loop which ties off the ovary and tube, should these be removed (Lapthorn Smith). On the other hand, some operators fix the broad and round ligaments to the parietal peritoneum. Vineberg's operation of vaginal fixation of the broad and round ligaments have not, in that operator's hands, been followed by any death. Howard Kelly, in his utero-suspension cases, has not had more than 1 per cent. of failures.

If we review the statistics of a number of operators, the choice appears to lie mainly between four procedures, or the modifications of these. (1) The Alexander-Adams operation, or some one of its modifications; (2) ventro-fixation; (3) utero-suspension; and (4) vagino-fixation.

* *Amer. Jour. Obstet.*, July, 1902; *Annals Gyn. and Ped.*, Dec., 1902.

Alexander's Operation.

Alexander himself has not to any great extent modified his original operation in any case in which the uterus is movable. He insists that he never recommends it for an adherent uterus, and that it may be contra-indicated in diseased conditions of the adnexa. In such cases he performs a preliminary vaginal *cœliotomy*, exploring the pelvis and separating adhesions. With rare exceptions he has not found it difficult to discover the ligaments, the guide being the clear glistening aponeurosis of the external oblique outside the external ring. If the ligament be not seen lying below over the lower pillar, he divides the transverse fibres so as to expose it, cutting the nerve and pulling it gently out with the fingers. He emphasizes the necessity for straightening the uterus before operating in old retroflexion, using a galvanic stem supported on a Hodge, which is retained for three weeks, the patient being in bed. He retains the lever pessary for two or three months, requiring the patient to be seen one week after it is removed, and once every month subsequently for some months.

The steps of Alexander's original operation are as follows :—

1. An incision, varying in length and depth according to the thickness of the abdominal wall, and the amount of adipose tissue, upwards and outwards, so as to expose the tendon of the external oblique muscle.

2. The search for and exposure of the external abdominal ring, and section of the oblique and inter-columnar bands.

3. Exposure of the end of the round ligament, and the freeing of it from the surrounding fatty tissue.

4. Careful isolation of the ligaments from the surrounding tissue, and freeing it from any adhesions, so as to enable the operator to pull on the ligaments and draw them forward to the required extent.

All these steps have to be taken cautiously and gently. Roughness or unnecessary force may rupture the ligaments and tear their thinner ends.

5. The uterus is now placed in position by a sound or obturator, or by the fingers of an assistant, and at the same time another assistant draws each ligament out to the required extent, while it is being stretched to the pillars of the ring by suture passed from one pillar to the other, embracing the ligament in its passage. Alexander prefers silkworm gut. These sutures are buried.

6. The loose ends of the ligaments are now cut off, all bleeding

is arrested, and the wound is closed. A Hodge is placed in the vagina. The wound usually heals by first intention.

Modified Alexander-Adams Operation.—I may now describe the operation as I perform it. It gives me complete satisfaction :—

The operation is a modification of those of Edebohls,* Kocher, of Berne, and Parker Newman of Chicago. The first-named opens the canal for its whole length, guarding the ilio-inguinal nerve in drawing out the ligament, slipping back the inverted peritoneum, and shortening the ligaments from 7 to 10 cm. The technique of the operation is as follows :—

The first three steps of the operation are the same as those just described. The inguinal canal is now opened as far as the internal abdominal ring, which is sought for, and dilated with the finger. The round ligament is next freed and isolated as far as the internal abdominal ring, and made to run free from any attachments. The uterus is then anteverted by the fingers of an assistant, or by the uterine elevator. The round ligament is drawn well forward, and, by a series of interrupted cumol-gut sutures, is fixed from the internal abdominal ring downwards in the canal, the lower portion being attached to the pillars of the external abdominal ring. The lower loose end is next cut off, and the proximal end is sutured to the aponeurosis. These sutures are now tied, and the canal is thus completely closed. Perfect union having been secured, the skin is closed with celloidinzwirn or bronze aluminium wire. The same technique is followed on the other side. The wounds are dusted with some dermatol powder, over which sterilized iodoform gauze and wool are placed. A double spica bandage is applied, and the patient placed in bed with her knees supported on a pillow. Scrupulous asepsis being maintained, the wound heals by first intention. A light celluloid Hodge is placed in the vagina after the first few days, and this is retained for some weeks. *Personally, I reserve this operation for cases of mobile uterus without adhesions and adnexal complications in women during the child-bearing period.* There is no possibility of a hernia following such an operation as that described.

Reviewing the statistics of some thousands of cases of the Alexander-Adams operation, performed by different methods, we may arrive at the following conclusions :—

The mortality at the outside does not amount to 1 per cent. With scrupulous asepsis union generally occurs by the first intention, and sinuses from suppuration are rare. The results in pregnancy and during labour are excellent. If the ligaments be thoroughly secured and anchored, relapses do not occur. Few have a larger experience of the operation than Laphorn Smith (Montreal), and his results completely verify these conclusions.

Other Methods.—The *intra-abdominal method* which he practises is practically that of Olshausen, the ligament being looped up and tied into the loop which ligatures off the ovary and Fallopian tube, should it be necessary to remove these. Otherwise the ligament is simply shortened by drawing up a loop of it and stitching it to itself for a space of about two inches. Or, the loop having been formed, the ligament may be anchored to the sub-peritoneal fascia and peritoneum.

* *Amer. Gyn. and Obstet. Jour.*, Dec., 1896.

Transverse Incision.

Villard modifies Alexander's operation by making the incision a transverse one, from one inguinal canal to the other, drawing the round ligaments forward, tying these together, and securing them by sutures to the symphysis, and also to the external abdominal rings. Schucking opens the vaginal vesico-uterine fold, transfixing the broad ligament with a large-handled needle, and passing the thread round the fundus uteri, transfixing the other broad ligament, thus bringing the thread forward, and knotting it in the anterior vaginal wall. Wertheim, Bode, and Koblanck fix the round ligaments in the vagina.

Baldy's Operation.—Baldy picks up the round ligaments on each side of the uterus, and ligatures these close up to it, thus securing the artery. The ligaments are then divided near the ligatures. Bleeding having been controlled by ligaturing the vessels, the broad ligament is perforated by forceps, and the divided pelvic end of the round ligament is pulled through the aperture until it appears on its posterior side. The ligaments of the two sides are treated alike. Their cut ends are attached by sutures to the posterior aspect of the cornua of the uterus, directly behind the original point of attachment of the ligament.

Newman, of Chicago, having thoroughly freed both ligaments, leaving a loop of ligament some four inches in length at either side, stitches it together, fastening the ligament into the aponeurosis and wall of the inguinal canal by buried gut sutures. *Laphorn Smith* does not open the inguinal canal, and does not cut a single fibre of the inter-columnar fascia, but he is most careful in discriminating the cases which require ventro-fixation or uterine suspension from those which can be treated by the Alexander method. *Taylor of Birmingham* uses fine ophthalmic silk as a buried suture, to close entirely the wound in the external oblique, and to sew the upper end of the ligament to the under surface of the aponeurosis.

Noble's Operation.—G. H. Noble * adopts the transverse incision down to the outer edge of each rectus muscle, separating these latter and then opening the peritoneum. The remaining steps of the operation are as follows :—†

(1) With light forceps one of the round ligaments is grasped about the middle of its intraperitoneal portion; by traction on the forceps the uterus is pulled somewhat to that side of the pelvis which is opposite the ligament held, the peritoneum is drawn away from the region of the internal abdominal ring, and the ligament made taut, so that it may be the more readily recognized in the extraperitoneal manipulations to follow. (2) Just beyond the outer edge of the rectus, at the end of the transverse incision, the point of a pair of artery forceps is thrust through the posterior sheath of the muscle, but does not enter the abdomen. The forceps is opened and withdrawn, so that an aperture large enough to admit the index finger is left. The finger is

* *Amer. Jour. Obstet.*, Feb., 1903.

† Kustner had been one of the first to adopt the transverse incision. Kuhne (Marburg) subsequently reported on it (*Centrallb. f. Gyn.*, 1901, No. I.).

introduced into the subperitoneal fat and feels the round ligament without difficulty, for it is brought into prominence by tension on the forceps which holds its uterine end. (3) The finger, passed through the opening, is hooked under the extraperitoneal portion of the ligament from below upward, and draws it up into the wound. The sheath of the ligament is then split open by blunt dissection. The sheath and the peritoneum are stripped back in the direction of the uterus, completely divesting the ligament of its covering. It is then drawn out of the wound, and forceps is slipped underneath, to retain it, until the opposite ligament has been raised and denuded in the same way. If the uterus has been in marked retroversion, the ligaments will have become so attenuated as to allow their approximation in the median line in front of the recti, which approximation will restore the uterus to its normal position. (4) The peritoneum of the median incision and the recti muscles are closed with continuous kangaroo or catgut sutures. (5) The ligaments are approximated in front of the recti and tied together. (6) The cut edges of the aponeuroses are stitched together. When one or two loops of the suture have been passed, the needle, in crossing the interval between the two edges, is made to pass through the ligament. This process is continued as each successive loop is passed until the centre of the incision is reached, when the free end of the suture is clamped and left long. Starting from the other end of the transverse incision, a second strand of kangaroo tendon unites the edges of the aponeurosis on that side and picks up the round ligament. The kangaroo tendons are tied together, and the ligaments are thus embedded and firmly anchored between the aponeurosis and muscles, where they contract extensive adhesions.

Ventro-fixation.—This operation should only be performed on women past the child-bearing period.

The usual aseptic precautions having been taken, and the mons veneris carefully shaved, an incision from two and a half to three inches in length is made. The peritoneum is opened, two fingers of the left hand are carried well down behind the uterus, and its position and mobility determined. The adnexa of either side are brought up and examined, and, should they be diseased, the puncturing, resection, or extirpation of the cysts is determined upon. The uterus is now raised with the fingers and brought forward, and there is usually no difficulty in this manoeuvre. The summit is now lightly caught by a single tenaculum. The first suture of gut is passed through the sheath of the rectus, the muscle, sub-peritoneal fascia, and peritoneum, and is carried about an inch beneath the summit through the posterior wall, taking in sufficient of the latter to secure the suture. Another fairly strong gut suture is carried through the anterior surface of the fundus, a short distance from the summit, and a third, if it be thought needful, is passed one inch beneath this. These sutures, clipped together with catch forceps,

are allowed to remain loose. The peritoneum is now closed by fine interrupted sutures of silk; the margins of the raised rectal sheath and muscle are next carefully brought together and united in the middle line. The three original sutures are now tied, and, finally, the skin is closed.

Suspension of the Uterus.—This is a totally different procedure in principle and detail of technique from ventro-fixation. The uterus is attached to the peritoneum and sub-peritoneal fascia, and is thus suspended. An incision, similar to that in the fixation operation, is made, and the peritoneum opened. The uterus is hooked up and lifted forward by the fingers, and the ligatures are passed through the peritoneal and sub-peritoneal fascia, through the fundus of the uterus on its posterior face a short distance from the summit, being carried

through corresponding points of the peritoneum and sub-peritoneal fascia on the opposite side. These sutures are caught with hæmostatic forceps at either side. The wound having been carefully cleansed with dabs wrung out of formalin (a few of which are passed, with light clamp forceps as spongeholders, behind the uterus to dry off any

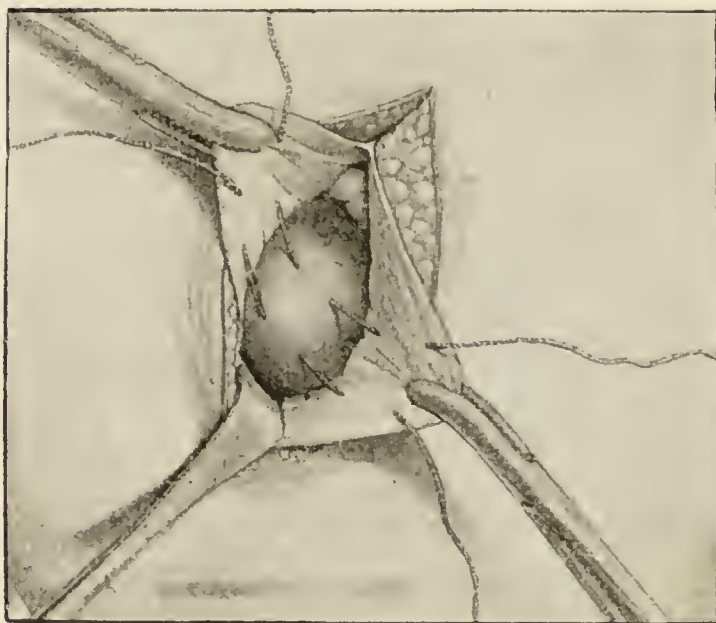


FIG. 185.—LIGATURES PASSED THROUGH PERITONEUM AND UTERUS. (HOWARD KELLY.)

blood), the omentum is carefully replaced, the peritoneum is sewn up with continuous fine suture of cumol gut, the uterine ligatures being tied *en route*. The fascia is next detached from the rectus muscle, and carefully united with stronger cumol gut in another continuous suture, the skin being closed with celloidinzwirn or silk-worm gut.

It is to be preferred to the Alexander-Adams in cases in which there is any suspicion of diseased conditions of the adnexa, and where there are adhesions; and to “fixation,” when there is any possibility of conception—indeed, all through the child-bearing period; again, in cases where the uterus is enlarged, and it may be necessary to enucleate a small myoma embedded in its wall. Howard Kelly, who initiated the operation, passed

the ligatures through the uterus below the fundus, on its posterior face.

Uterine Suspension by the Round Ligaments.—The operation I now perform is different from the last, inasmuch as the body of the

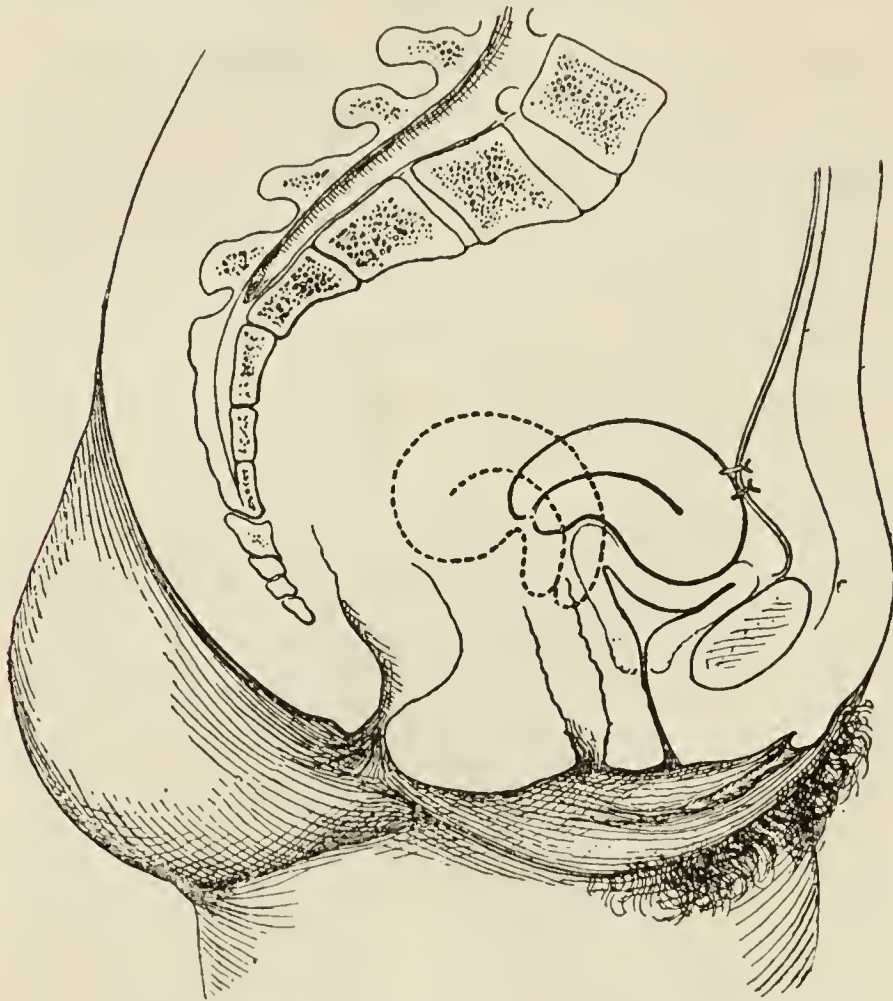


FIG. 186.—UTERUS SUSPENDED. (HOWARD KELLY.)

uterus is not involved. The preliminary steps are the same. After the adnexa have been examined, and dealt with if necessary, and the uterus has been brought forward, the round ligament at one side is hooked up on the finger, and a fairly thick cumol gut ligature is carried through the peritoneum and sub-peritoneal fascia with a curved needle, taking in both sides of the loop of the ligament. The two ends of the ligature are caught in a hæmostatic forceps, and allowed to drop over the side. The same procedure is carried out on the opposite side. The wound and pelvic cavity are carefully cleansed. The inner end of one of the ligatures is now carried from within, out through the peritoneal and sub-peritoneal fascia of the opposite side, and the same is done with the other. Thus the two ligatures cross each other, either holding a loop of the round ligament close to the uterine cornua. The peritoneum is now sewn up with cumol gut, and the round ligament ligatures are tied *en route*. The remaining part of the toilet is the same as in the other operation.

Vaginal Fixation.

Extra-peritoneal Vagino-fixation (Müller's Operation).*—After preliminary curetting of the uterus, and application of 50 per cent.

* From Edge's admirable description of the operation (*Brit. Gyn. Jour.*, Aug., 1896).

solution of carbolic acid, which should not be omitted on account of the frequent co-existence of endometritis with backward displacements of the uterus, and likewise because of the possibility of a suture entering the uterine cavity, and consequent danger of infection, the uterus is pushed into the position of ante flexion by means of Orthmann's instrument (Fig. 188) and drawn strongly downwards. The anterior vaginal wall is then cut from the point of its insertion into the cervix up to the meatus urethrae, but not reaching the latter by 2 cm. If cystocele be present, a vertical oval of mucous membrane is marked out and at once removed.

The author preferably carries this denudation close to the urethra, so as to remove the strong protrusion of the urethra so often left after labours, and which is the earliest sign of prolapse of the anterior vaginal wall.

After this the bladder is separated from the vagina through the

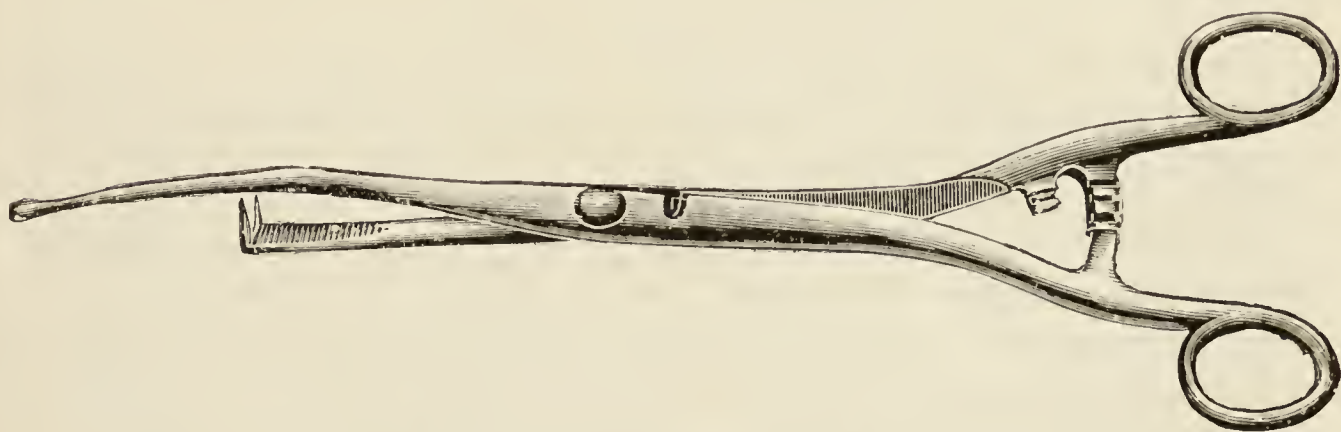


FIG. 187.—ORTHMANN'S INSTRUMENT.—COMBINATION OF SOUND AND CLAW FORCEPS.

incision, and with the haft of a knife from the cervix; the fingers may also aid in this. For this purpose also a solid catheter is passed into the bladder. The latter is drawn away from its connections, and held up by a retractor, or fixed in its displaced position by a few temporary catgut sutures. It is only by this thorough careful separation of the bladder in the first stage that injury of it by the sutures, or pressure upon it by the uterus, can be avoided, and, in case of pregnancy, this allows of uterine expansion without dragging the bladder up. If the uterus should not be large, and if it be movable, it protrudes from the incision after the bladder has been drawn up. It is then easy to reach the peritoneum on the anterior uterine wall, and its point of reflection upon the bladder. Half a dozen strong catgut sutures are next passed transversely in the anterior uterine wall, beginning at the wound above. The points of entrance and exit of the stitches are 2 cm. apart. Then these

stitches are carried through the edges of the wound 1 cm. from the margins. The sutures are not tied yet, but the vaginal wound is closed with a continuous catgut suture from the urethra to the cervix. Orthmann's instrument is removed, and then the sutures are tied in the order of their insertion. The cervix is pushed upward and back as far as possible, and pressure applied from above on the fundus puts the uterus into an advanced position of anteversion, in which it is fixed by firm tamponing of the vagina with iodoform gauze. The bladder is freed. The patient is kept in bed for eight or ten days. The catheter is used if necessary; the gauze is removed, and astringent vaginal douches are given. Secondary treatment generally extends over eight or ten days. Usually the operation is easily performed without any trouble.

The advantages of this operation are: It is performed in the vault of the vagina; it is less dangerous than others; convalescence is speedy.

Mackenrodt, recognizing the danger of adhesions which cause anteversion from Dührssen's method of fixing the uterus to the vagina outside the peritoneum, has lately performed, as we have already stated, vesico-fixation. In this operation there are the dangers of peritoneal hæmorrhage, perforation of the intestine or bladder, and last, though not least, sepsis. In many of Mackenrodt's cases of vagino-fixation, the patients complained of bladder troubles, and at times pyosalpinx resulted. If vagino-fixation be necessary, he operates by separating the bladder from the uterus and opening the abdominal cavity; the anterior flap of the peritoneum is stitched to the top of the uterus, and then the posterior surface of the bladder to the front of the uterus, thus closing the vesico-uterine pouch.

Intraperitoneal Vaginal Fixation (A. Martin's method).—The genitals having been shaved, and the thorough disinfection of

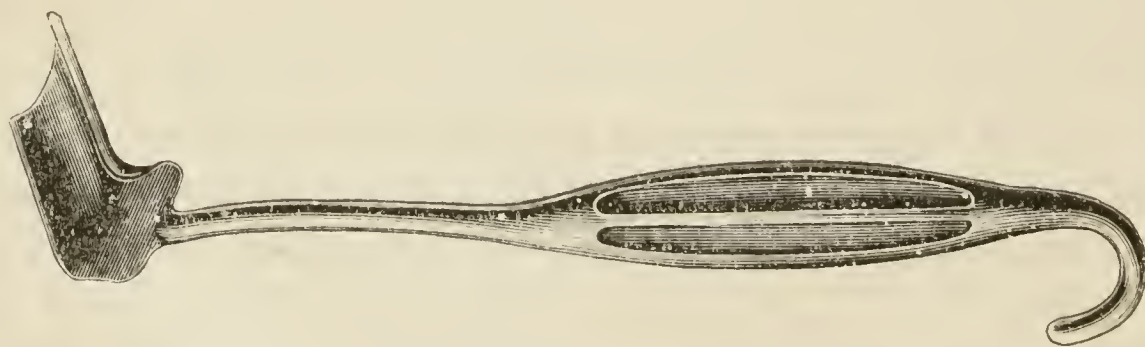


FIG. 188.—A. MARTIN'S PERINEAL RETRACTOR.*

the vagina secured, the woman is brought well to the edge of the table, a capable assistant at either side holding the thighs apart. The operator sits in front, the uterus is drawn down, and its length

* For A. Martin's large perineal retractor, see List of Appliances.

and position are ascertained by the sound. The cavity is next curetted, and any *débris* laid aside for examination. It is now washed out with a pipette, and a little perchloride of iron solution is injected. Orthmann's combination of uterine sound with claw forceps is now taken, and the sound extremity having been passed into the uterus, the neck is seized, and the uterus is drawn down-

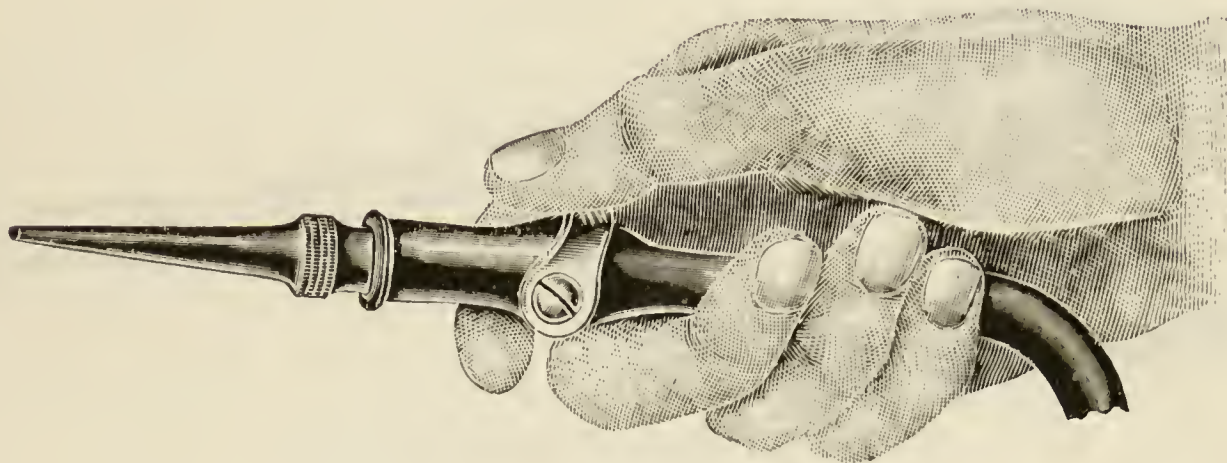


FIG. 189.—VULCANITE PIPETTE.

wards, so as to place it and the anterior *cul-de-sac* well on the stretch. One of the assistants seizes the vaginal retractor below the urethra, drawing it well up out of the way, at the same time that, *with the same hand*, he directs the stream of aseptic fluid from an irrigating pipette over the parts, and this continues to play through the entire operation. The operator, thus fixing and stretching the uterus with one hand, carries an incision directly in the middle line through the

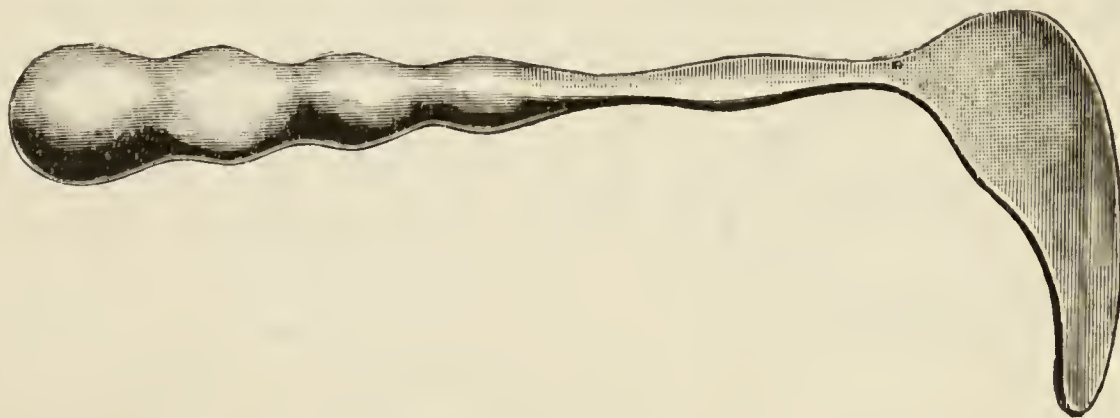


FIG. 190.—LARGE CONICAL RETRACTOR OF MARTIN, TO PROTECT THE BLADDER.

mucous membrane. (If it be desired to do anterior colporrhaphy at the same time, the incision is carried elliptically at either side so as to remove an oval portion of the mucous membrane.) This is then reflected up with a few strokes of a knife, and the sub-mucous tissue is cautiously divided, the greater part of the remainder of this step of the operation being effected with finger, scissors, or

knife-handle, or cautious dissection with scalpel. The retractor is carefully used to protect the bladder and keep it out of harm's way. When the peritoneum is reached and divided with scissors, the retractor is slipped underneath, the uterus is seized higher up, and gradually overturned and brought into the vagina. Then the ovary and tube at either side are sought for, seized, brought into view,

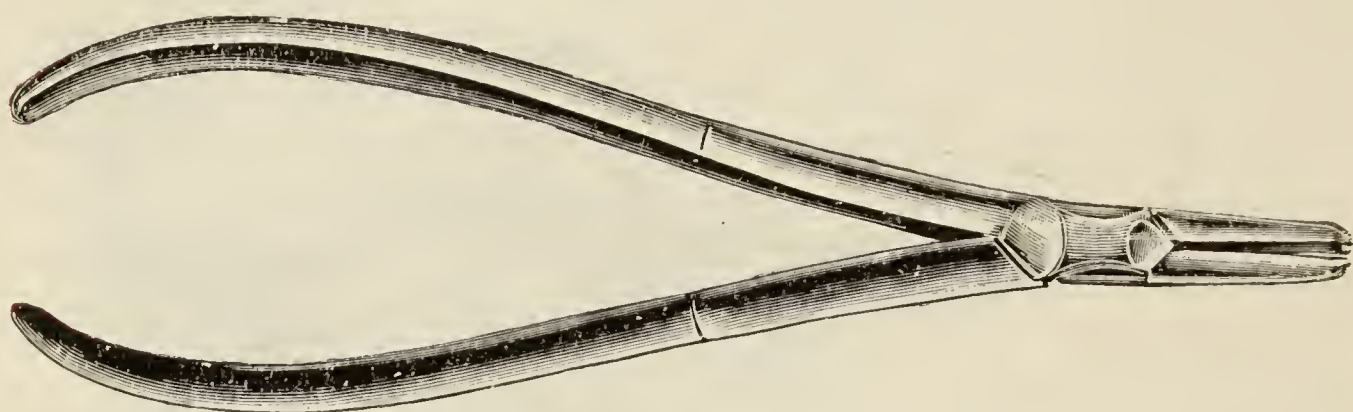


FIG. 191.—MARTIN'S NEEDLE-HOLDER.

and examined. If healthy, they are returned, or the ovary, if follicular, may first be stabbed in several places with the point of a knife; otherwise the affected adnexa are resected or removed *in toto*. The uterus having been returned, the gut sutures are carried through the lips of the vaginal incision, and made to include the uterine wall



FIG. 192.—VARIOUS-SIZED CURVED
HYSTERECTOMY NEEDLES.*
(A. MARTIN'S PATTERN.)

in continuous fashion. The peritoneum is now closed, and likewise the vaginal opening, with continuous sutures. Of course, if simple colpotomy alone be performed, the uterus and appendages are returned, and only sufficient interference is resorted to as the occasion demands. The operation in the majority of cases where the womb is not fixed by adhesions, or the adnexa considerably diseased, can be rapidly performed, the great point being that the bladder should be drawn well up out of reach, and carefully guarded by the retractor.

Amputation of the neck of the uterus can be combined with this procedure, the posterior lip being first removed, and the flap sutured

* There is a size smaller than that depicted in the figure.

with gut, the anterior being left until the vagina has been closed, when it is also removed, and the flap similarly sutured with gut.*

Vineberg's Operation—Traction through the Round and Broad Ligaments.

The principle consists in making traction on the uterus by means of the round and broad ligaments, and not on the uterine wall, thus leaving the uterus free to enlarge during pregnancy. The patient is prepared as if for vaginal hysterectomy. The cervix is drawn by a vulsellum downward and outward to the vulva. Another vulsellum catches the anterior vaginal wall near the urethral opening and is held upward. In this manner the anterior vaginal wall is put upon the stretch. A longitudinal incision is now made extending from the mound just behind the urethral meatus to the vaginal attachment of the cervix. The two flaps thus formed are separated from the underlying bladder. They should be separated freely, and then the utero-vesical pouch of peritoneum is opened. The opening between the bladder and the uterus should be dilated as much as possible. The bladder is held out of the way by an anterior vaginal retractor. The anterior wall of the uterus is exposed and a silk traction suture should be passed, by which the uterus can be pulled down into the incision. If the adnexa must be examined they can be delivered by hooking two fingers over the fundus and drawing them forwards. In cases where they need not be delivered, and where visual inspection of them is unnecessary, the two fingers are hooked behind one horn of the uterus and the corresponding tube and round ligament are drawn well into the incision. A suture of silkworm gut is carried behind the round ligament about three or four centimetres from its insertion into the uterus. It is passed from above down and is made to catch a portion of the tissue immediately beneath the ligament. A second one may be passed nearer to the uterus. The same is done on the opposite side. These round ligament sutures on each side are then carried to the vaginal flap, at a point corresponding to the lateral sulcus, as near the pubic arch as possible. They are tied loosely while the uterus is held forward by the traction suture. The peritoneum is closed by continuous catgut suture and the vaginal flaps are brought together, previous to which the traction suture has been removed. It may be necessary in some cases to apply an additional uterine fixation suture.

* See chapter on 'Vaginal Hysterectomy' for other instruments, as scissors and retractors, etc., required in colpotomy; also the operation of *coelio-salpingo-oöphorectomy* for a complete description of the operations of anterior and posterior colpotomy.

CHAPTER XIII.

UTERINE DISPLACEMENTS (continued).

Prolapsus.

By prolapse of the uterus we mean a descent of the uterus in the pelvis; this descent is attended by relaxation of the vaginal walls, prolapse, and frequently inversion of the vagina itself. The bladder is involved according to the degree of the prolapse. If the uterus pass outside the vulva, we may have an accompanying cystocele or rectocele, both bladder and rectum being dragged on by the descending uterus and vagina. The prolapse is divided into three stages: in the first the uterus lies entirely within, in the second it makes its appearance outside, the vulva, and in the third it is protruded entirely outside the vulvar orifice. The two latter stages



FIG. 193. — SHOWING
GRADUAL DESCENT OF
UTERUS. (THOMAS.)

are also styled 'proidentia.' The influence exerted by the uterine peritoneal supports, the vagina, and perineum, in maintaining the uterus in its position in the pelvis has been already referred to. We find four conditions associated with, and contributing to, prolapse: relaxation of the pelvic ligaments, atonicity of the vaginal walls, relaxed vaginal outlet, and weakened or absent perineum. Further descent of the uterus necessarily means version. As the heavy uterus descends, the fundus yields to the abdominal pressure, and is directed or forced backwards. A state of retroversion thus ensues.

The displacement may commence with retroversion or anteversion of the uterus—commonly the former; or the descent of the womb may be consequent upon a prolapsed condition of the vagina. It is rare to see a well-marked case of prolapse of the uterus where there is not vaginal prolapse, which, in the great majority of instances, has occurred synchronously with the uterine descent, the causes which operate in producing the one displacement at the same time

tending to induce the other. It is frequently difficult to say whether these causes have first taken effect on the vagina or uterus. The uterus descends in the vaginal axis, and gradual inversion of the vagina accompanies its downward progress. The entire organ becomes congested, and, as a consequence, there is hypertrophy both of the supra- and infra-vaginal portions, generally greater in the latter, which is thickened and elongated. This hypertrophic condition of the entire cervix is an important factor amongst the causes producing complete prolapse.

If we thus take, in their sequence, the usual pathological events which operate during the occurrence and completion of the prolapsus or procidentia, they would be much as follows: (1) Relaxation of,

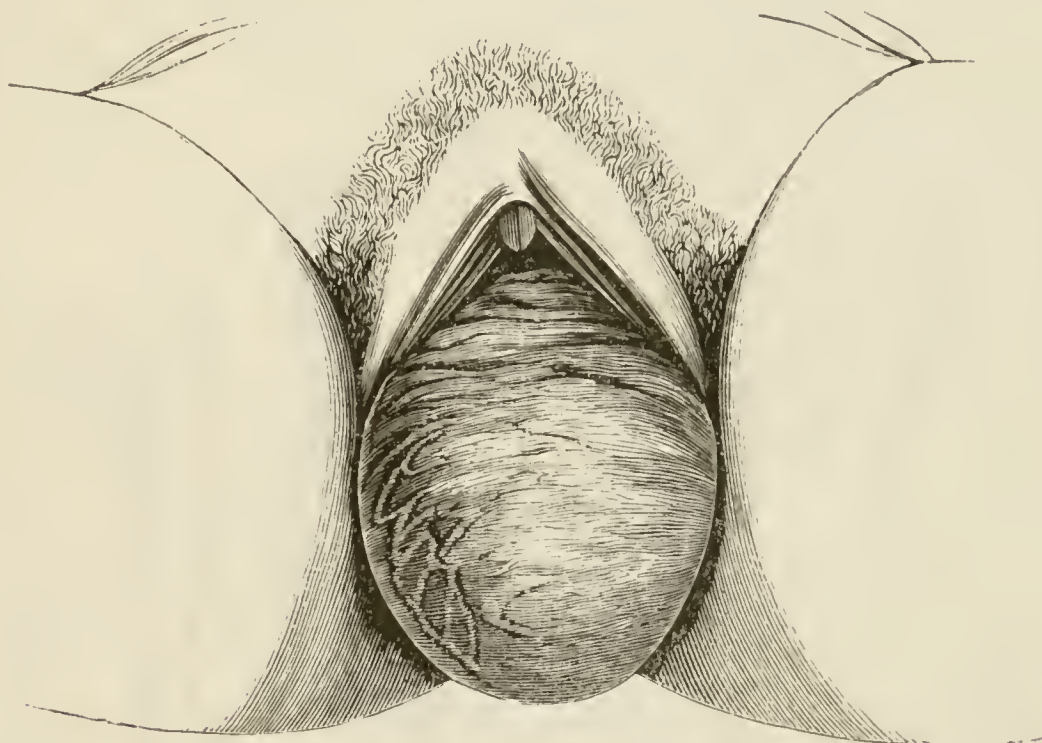


FIG. 194.—PROLAPSE COMPLICATED WITH CYSTOCELE.* (AUTHOR.)

or deficiency in, the uterine supports; (2) retroversion of the uterus; (3) descent of the uterus; (4) partial prolapse of the vagina; (5) incipient inversion of the vagina; (6) incomplete prolapse of the uterus, with descent of the bladder, and possibly of the rectum; (7) enlargement of the uterus, with hypertrophy of the supra- and infra-vaginal portions of the cervix, and eversion of the lips of the os uteri; (8) further inversion of the vagina, with protrusion of its anterior wall, and thickening of the mucous membrane, which gradually becomes hard and may be eroded in parts; (9) complete prolapse of the entire uterus and inverted vagina, both being altered by exposure and friction.

* This procident sac was reported upon by me many years since. The conditions corresponded exactly to the section seen in Fig. 196 and in Plates XVI., XVII., p. 309.

Causation.—The common predisposing causes are : Pregnancy ; deficient or absent perineum ; laceration of the cervix ; uterine tumours, abdominal tumours ; uterine hyperplasia ; imprudent clothing ; advancing age ; ‘too roomy’ pelvis ; constant standing, and the raising of heavy weights ; accident or shock ; labour, in which instrumental delivery has been necessary. In older women who have borne many children we occasionally find all the pelvic supports weakened, the ligaments enlarged, the vagina having a

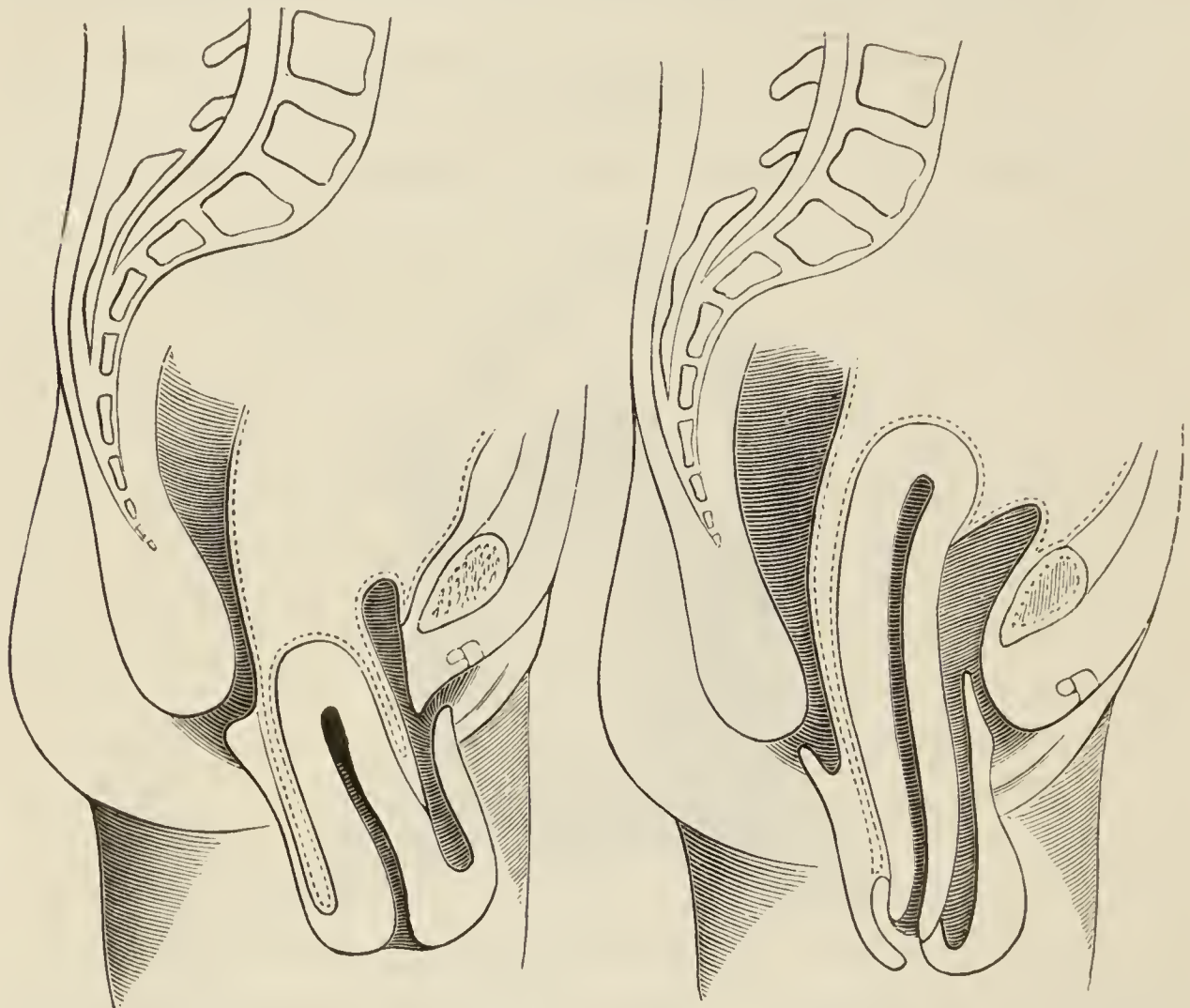


FIG. 195.—PROLAPSUS WITH CYSTOCELE. FIG. 196.—HYPERTROPHIC ELONGATION OF CERVIX. (SCHRÖDER.)

These drawings are placed side by side so that the two conditions, prolapsus and hypertrophy, may be compared. See Plates XVI. and XVII., p. 309, and the diagrammatic representations of the sections of the procident sacs.

tendency to prolapse, the perineum deficient in vital tone, and the sphincter-vaginal muscles also enfeebled.

Laceration of the cervix, as a consequence of labour, has as frequent attendants an enlarged uterus, a relaxed outlet, and a deficient perineum. Both uterine tumours and uterine hyperplasia cause increase of weight of the uterus, and so tend to prolapse. Pressure directed on the uterus from above, either from some abdominal tumour, or from the more common sources, tight clothing and heavy garments, pushes it downwards and induces prolapse. Great exertion, necessitating fixation of the diaphragm and straining

efforts of the abdominal muscles, when continued for a length of time in some laborious occupation, causes general weakness of the pelvic ligaments and a sinking of the uterus. This, with the secondary changes occurring in the uterus itself, is the cause of the descent.

During some violent efforts, as in epileptic convulsions, while straining at stool, or in a severe fit of coughing, the uterus may descend and be prolapsed. Such an accident is attended by great pain, symptoms of shock, and possibly internal hæmorrhage. As a rule, there has been some antecedent condition, as one of those causes mentioned.

It is well to remember that pregnancy has occurred in cases of prolapse, as also a tubal foetation, a submucous fibroid, an intra-uterine polypus, or adnexal disease.

Relaxed Vaginal Outlet.—Howard Kelly enters fully into the clinical appearances and treatment of this condition, which is so frequent an accompaniment of cystocele and rectocele, and which may have been present prior to, and independent of, any laceration of the perineum. The appearances as noted by him are those we are familiar with—a wide and somewhat everted anus, a flattened and broad buttock cleft, with the skin surface of the perineum unusually deep, while the fourchette is intact. On the other hand, the skin surface of the perineum

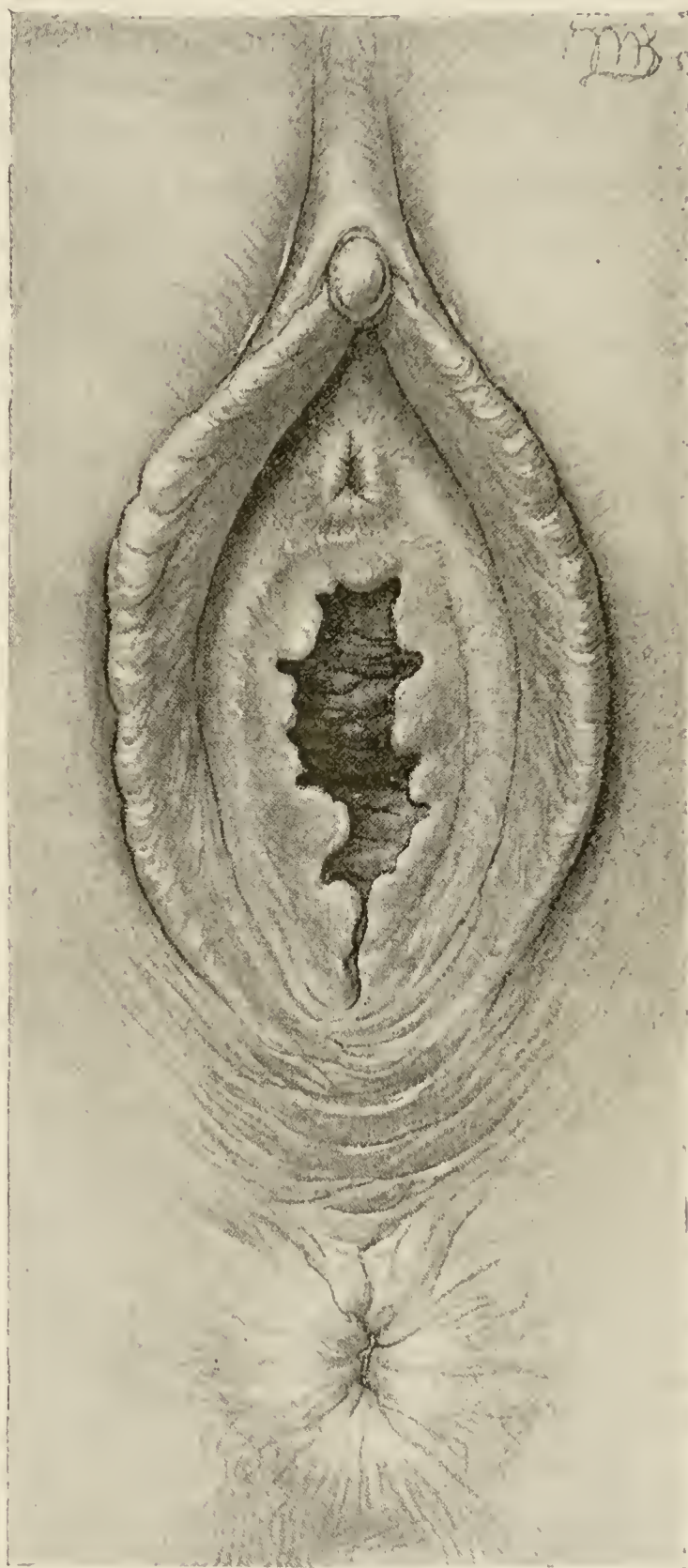


FIG. 197.—RELAXED VAGINAL OUTLET.
(HOWARD KELLY.)

may be torn, while the deeper structures have not been involved. In many of the worst forms of relaxation the perineum is deeper

on the skin surface than before childbirth, a condition due to the overstretching of the external skin at the time the outlet is broken down. On separation of the labia, there is pouting or protrusion of one or both of the vaginal walls. We can best estimate the degree of protrusion, and associated descent of the cervix uteri, by examination by the finger of the latter while the patient is standing. Examination of the perineum will demonstrate its relative thinness, and the strength or displacement of the levator ani fibres, the degree of relaxation and consequent effect on the pelvic organs, depending upon the degree of interference with, and the disposition of the fibres of, this muscle. The administration of an anæsthetic, by preventing contraction, enables us to determine more completely the extent and degree of the relaxation.

Symptoms.—Pain is felt of a ‘dragging’ and ‘bearing-down’ nature—mostly in the back and loins, aggravated by standing or walking. The patient occasionally complains of a sensation as if ‘something were coming down,’ when at stool. In the earlier stages the symptoms of retroversion are present; later on, when the bladder and rectum participate in the displacement, vesical and rectal distress follow; such distress is felt as rectal irritation, tenesmus, sense of pressure, occasional difficulty in defæcation, ending, when there is complete prolapse, in cystocele or rectocele. The congestion which accompanies the prolapse is often the cause of menorrhagia or metrorrhagia. In extreme cases the epithelial surface of the procident mass—at first thickened and rough—may inflame and ulcerate, and these ulcerations may scale over and occasionally bleed. The irritation from the urine still further increases such ulcerations. I have seen a large gangrenous slough on the surface of a procident uterus. This may be the result of strangulation of the mass at the vulvar opening.

Diagnosis.—In the earlier stages of prolapsus the os uteri is felt lower than usual, and the body of the womb deeper in the pelvis. The uterus may be anteflexed, or there may have been an antecedent retroversion. Even in this early stage we may detect incipient prolapse of the vagina and a flaccid condition of the anterior vaginal wall. If the uterus have descended for any distance, if it present at the vulva, or outside it, the least care will prevent any error of diagnosis. It is better to examine the patient standing, when we desire to estimate the degree to which the uterus has descended. It is well always to measure the uterine cavity with the sound. This is necessary, not alone to determine the

position of the uterus, but also to differentiate true prolapse of the uterus from prolapse complicated with elongation.

In ordinary prolapse the sound may pass a little further than natural into the uterus, or the canal may be normal in length; while if there be hypertrophic elongation of the cervix, the sound passes a considerable distance, proving that the uterine cavity is enlarged, while by palpation we feel the fundus in its proper position. If we pass the uterine sound into the prolapsed uterus, while in the state of procidentia, it may enter to the extent of some three or more inches. When the strain is removed from the relaxed tissues by reposition, it will be found to pass to about the usual length. With any exercise of caution, no one can mistake a case of procidentia for polypus or inversion of the womb. (See 'Hypertrophic Elongation of Cervix.')

Treatment.—We may divide the treatment of prolapsus thus: (1) prophylactic; (2) replacement; (3) retention; (4) operation.

Under the first class we include those general constitutional and local measures which tend to reduce the size and weight of the uterus. With this object we enjoin rest if the patient's circumstances will permit. Unfortunately, many cases of prolapse are met with in women who have to work for their living, and who cannot afford to rest. In the earlier stages, when we recognize the displacement, there should be free use of the vaginal douche, with astringent washes, such as those of alum, tannin, or sulphate of zinc, or tampons of salicylic acid wool and glycerine. The tampon can be introduced by the patient at bedtime, and worn during the night. When the vagina is tamponed by the

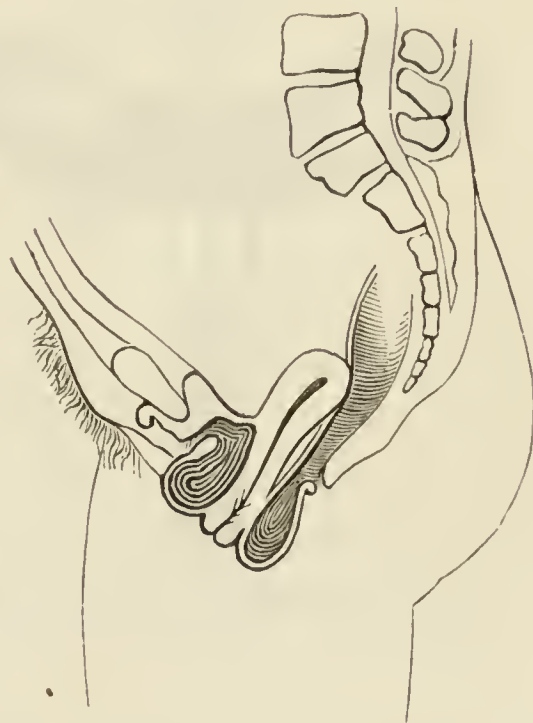


FIG. 198.—RUPTURED PERINEUM, RECTOCELE, AND CYSTOCELE WITH ELONGATION OF CERVIX, SIMULATING PROLAPSUS. (AFTER MARTIN.)

surgeon, the patient should be placed in the knee-elbow posture. Tight-lacing must be prohibited, and the undergarments suspended from the shoulders, and not from the hip. The patient may be made to wear a properly adjusted abdominal support or belt. This should fit accurately, raising and supporting the intestines above the pubes.

A silk-elastic support, made like a weft Nightingale cholera belt, is very comfortable, and will be found useful in many cases where our object is to keep the abdomen warm. They can also be had in Jaeger's flannel.

Regular cold bathing, and especially sea-bathing, is of service. Any constitutional or local condition which either promotes congestion of the uterus or favours relaxation of its supports, must be attended to. Occasional depletion of the cervix ; the administration (especially during the menopause) of such tonics as strychnine and the mineral acids, quinine and arsenic ; careful attention to the bowels, so as to prevent all straining at stool, the occasional use of a cold-water enema, and the correction of any version or flexion of the womb, are some of the simplest and most efficacious measures we can adopt.

It is of special importance to attend to any chronic cough, and to allay laryngeal and lung irritation. If the prolapse should have



FIG. 199.—ZWANCKE'S PESSARY
(OPEN).

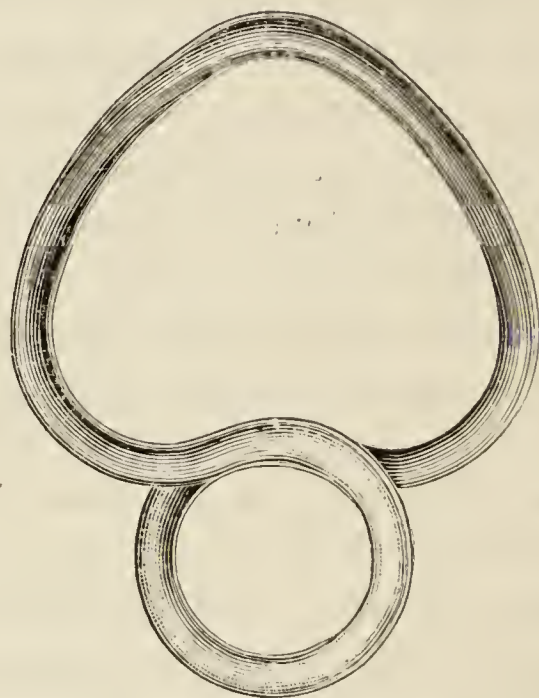


FIG. 200. — SCHULTZE'S FIGURE-OF-EIGHT PESSARY, MOULDED FROM CELLULOID RING, FOR RETROVERSION AND PROLAPSE.

lasted for some time, and the uterus protrude from the vulva, we have to replace it.

To replace the procident mass, we get the patient into the knee-elbow position, and, grasping the base of the tumour, we return that portion last which protruded first. The uterus can, if necessary, be prepared for the use of a pessary, and those means already detailed should be employed to contract the vagina and reduce uterine congestion.

To retain the uterus in position we have recourse to pessaries. We may classify those useful in prolapse under these heads :—

- (a) Those suitable in incipient descent, complicated with retroversion or antelexion.
- (b) Those applicable in incomplete prolapse of the uterus, with partial prolapse of the vagina.
- (c) Those suitable for complete prolapse of the uterus, with inversion of the vagina and loss of contractility of the vaginal walls.

For class (a) the best pessary we can employ is the ordinary Hodge. We may select any material we choose—vulcanite, cellu-

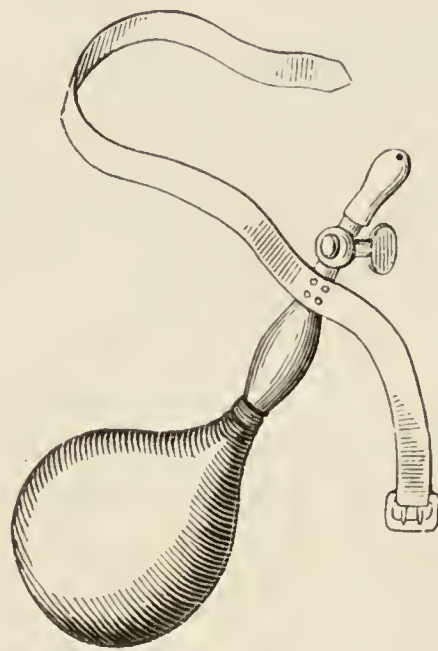
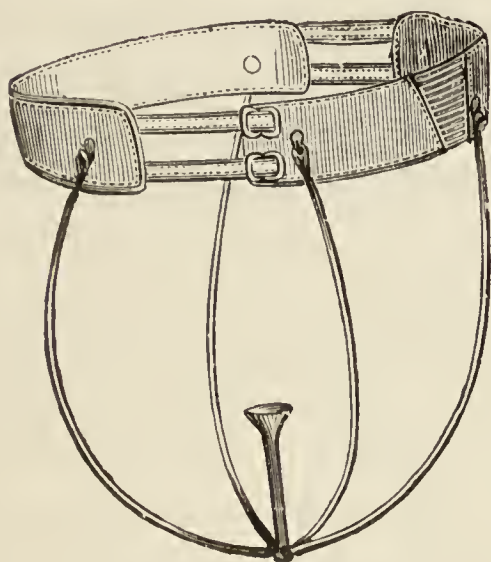


FIG. 201.—NAPIER'S PROLAPSE PESSARY. FIG. 202.—BRAUN'S COLPEURYNTER.

loid, or wire with rubber covering. The celluloid is preferable, as it is the easiest moulded to the shape and size we require ; we should always mould the shape and size. We adapt it according as the uterus is retroverted or antelexed. Galabin's pessary is an admirable support in those cases of descent complicated with antelexion. Schultze's figure-of-8 pessary, moulded from the celluloid ring, is also useful.

In class (b) Hodge's pessary will also be found to answer in a large number of cases. Here the pessary should be well cupped, large enough to retain its position, but not of such a size as to forcibly distend the vagina. All pessaries should be periodically removed and cleansed, and during their use, vaginal deodorant and antiseptic injections should be occasionally employed ; or we may try the rubber glycerine ring (Arnold)—it is by far the best soft ring pessary made. It has the disadvantage of requiring more frequent renewal. The ring must be of a size suitable to the case, sufficiently thick, and with a strong spring. In the third degree of prolapse, *if a patient will not submit to operation*, we may have to use a

Zwancke's pessary, of the vulcanite kind, or the wire modification of Clement Godson.

Many patients manage the vulcanite Zwancke best, and prefer it to the wire. It has the disadvantage that it is apt to accumulate discharge, and thus become unpleasant; also the screw which regulates the divergence of the wings is liable to be broken in screwing or unscrewing it. The patient should be taught how to insert or remove it. This latter she should do *before* lying down at night, placing the pessary in a disinfectant solution. Godson's is equally easy of adjustment, and it certainly has the advantage of greater cleanliness and durability.

In *complete* procidentia it will be found extremely difficult to sustain the uterus by any pessary. I dislike the principle of all pessaries. In some cases, material support and considerable comfort may be obtained from a carefully fitted abdominal support, to which is attached a perineal pad. In most cases of procidentia operation is the only proper course to advise.

Elongated Cervix, Complicating Prolapse of the Uterus or Vagina.—I do not intend to enter into the various matters in dispute regarding the relation of the hypertrophic elongation of the cervix uteri to prolapse of the uterus or vagina. I shall limit any observations to such practical points in the etiology and diagnosis of the affection as are requisite for every student and practitioner to know. The following facts, which are now generally accepted, have a practical bearing on the management of this condition:—

Causation.—1. The cervix uteri may be hypertrophied and lengthened out either in its infra-vaginal or supra-vaginal portions. Whether this elongation be a primary growth (Huguier), independent of any dragging action of the prolapsing vagina and bladder, or a consequence of this latter, is a matter of dispute. J. Taylor considers that it is the result of non-involution of the uterus after labour, when the uneffaced infra-vaginal cervix drags on the non-glandular isthmus and draws it out. He does not believe in the commonly accepted doctrine of the effacement of the glandular cervix during pregnancy, and is of opinion that it is simply hypertrophied and temporarily expanded.

2. Elongation of the infra-vaginal portion of the cervix is not, as a rule, attended with prolapse. The fundus remains at its proper level in the pelvis, nor does the os descend so far as to protrude. *There is a peculiar elongation of the anterior lip accompanying this condition, known as 'tapiroid.'*

3. Hypertrophic elongation of the supra-vaginal portion is, sooner or later, associated with prolapse and procidentia of the uterus and bladder. There are here two principal factors—growth and traction: which is the initial process it is difficult to say. It would seem that each has an independent share in the early stages of the distortion. It is difficult to define the exact spot where the 'vicious circle' commences.

4. Eversion of the lips of the os uteri, with exposure of the cervical canal, and laceration of the cervix, are common attendants on this form of prolapse of the womb.

The most frequent complications of hypertrophic elongation of the cervix are: faulty involution of the uterus after labour; and laceration of the cervix during labour (in these latter conditions we find the two associated states which usually produce hypertrophic change, viz., hyperæmia and hyperplasia); fibroid tumours; pelvic adhesions; uterine displacements; laborious occupations.

Various Views on the Operative Treatment of Procidentia and Prolapse of the Uterus.—Were the treatment, prophylactic and palliative, for prolapsus uteri undertaken during its earlier stages, and were such conditions as retroflexion, hyperplasia of the uterus, incipient rectocele or cystocele, deficiency of perineum, and relaxed vaginal outlet, early recognized and dealt with, there would be no necessity for many of the extreme measures which are called for by the more advanced and graver forms of the affection. The operations, which in the great majority of cases are sufficient to cure the milder types of prolapse, are perineorrhaphy, various forms of colporrhaphy, and rectification of a relaxed outlet. In more advanced stages we may have to add to these amputation of the cervix uteri, ventro-fixation, or an Alexander-Adams operation, with more extensive denudations for either rectocele or cystocele, and attachment of the bladder; later still, in the most aggravated forms, shortening of the utero-sacral ligaments, or, as I should personally prefer, hysterectomy with partial ablation of the vagina, or, as others advise, the alternative of its complete extirpation.

In the discussion on a paper by Kuestner,* who advocated contraction of the lumen of the vaginal canal, ventral fixation and colporrhaphy, fixation of the uterus to the posterior pelvic wall, and, in isolated cases, pan-hysterectomy, A. Martin argued that it was not enough to perform extensive colporrhaphies, but that the uterus and the whole pelvic connective tissue should be included in the plan of operation. In displacement of the bladder, a new system of support should be secured, either by gathering up its base, vesical fixation, or retro-fixation. Removal of the uterus was indicated when it was so diseased that this step must be taken even were it in its normal position. As a *dernier ressort* extirpation of the entire procident mass might be justified. Total extirpation of the uterus and vagina was indicated in many cases; he had performed it in nineteen out of two thousand. Schauta makes a longitudinal incision in the anterior vaginal wall, which is undermined, and the bladder pushed upwards. The uterus is brought forward out of the

* Congress Germ. Gyn. Soc., 1903; *Zentralb. f. Gyn.*, No. 27.

peritoneal cavity, and fixed into the vesico-vaginal septum, the vagina being closed behind the uterus. Thus cystocele is prevented, and the vagina completely closed. Bumm (Halle) performs total extirpation more frequently, as it is an absolute cure. This refers to patients at or after the menopause. Doederlein supports the same view. Crobak practises ventro-fixation and vaginal shortening of the round ligaments. Total extirpation was only justifiable after the child-bearing age. Freund advocates colporrhaphy, ventro-fixation, and, in cases of extreme prolapse, panhysterectomy, at or after the menopause.

Edebohls inclines, as also does Christopher Martin, who first performed the operation in England, to complete extirpation of the vagina in these extreme cases.

‘If we ever intend,’ as Gaillard Thomas insists, ‘to inculcate, true, rational, and reliable precepts,’ we must regard the perineal body as the triangular concavo-convex body, with its apex superiorly, composed of strong elastic connective tissue, that fills in the space between the anterior wall of the rectum posteriorly, the vaginal wall anteriorly, and the summit of the vagina above. This elastic connecting pillar is itself under the influence of, and is supported on, muscles, the tendency of whose action is to throw the perineal pillar upwards and forwards, thus assisting in the support and closure of the vaginal canal. Together with it these muscles (1) sustain the anterior wall of the rectum, and prevent a prolapse of the bowel, which, did it occur, would inevitably drag downwards the upper vaginal concavity, and with it the cervix uteri, and destroy the equilibrium of the uterus. (2) They support the posterior vaginal wall, and prevent a prolapse of this partition, which would favour rectocele. (3) Upon the posterior vaginal wall rests the anterior, and upon this the bladder, and against the bladder lies the uterus—all of which depend in great degree for support upon the entire perineal body. (4) They preserve a proper line of projection of the contents of the bladder and rectum, and so prevent the occurrence of tenesmus, a frequent cause of pelvic displacements. Thus the entire perineal structure may be truly said to form “the keystone of the arch” on which the uterus is supported in the pelvis.* The part played by the utero-sacral folds has been already discussed.

Some Operative Procedures for Prolapse of the Uterus and Vagina.

Deferred closure of perineum.	Doléris’ operation.
Tait’s operation for laceration of the perineum.	Reamy’s operation.
Doléris’ modification of same.	Colpoperineorrhaphy (Martin’s operation).
Dührssen’s operation.	Amputation of the cervix, by Sims’, Schroeder’s, and Martin’s methods.
Lateral, anterior, and posterior colporrhaphy.	Ventro-fixation.
Sims’ operation.	

* I have here modified the early teaching of Gaillard Thomas, in which I consider sufficient stress was not laid on the part played by the perineal muscles in the pelvic floor, or the utero-sacral ligaments.

Alexander-Adams' operation.

Colporrhaphy with either ventro-fixation or Alexander-Adams.

Colpo-hysteropexy (Sänger's operation).

Panhysterectomy with colporrhaphy.

Operations on the utero-sacral ligaments.

Extirpation of the vagina.

Colpectomy (Müller).

We need feel no surprise when, in consequence of laceration during parturition, or from atonic states due to prolonged pressure or constitutional debility, the perineal body no longer performs its part in the mechanism of the pelvic supports. Displacements of the uterus are amongst the consequences, and especially prolapsus. Assuredly if surgeons only recognized the ills, immediate and remote, which follow lacerated perineum, we should less frequently hear of 'secondary operations.' The sensible obstetrician stitches the perineum *at once* when he recognizes the laceration after parturition. The futile plan of binding the knees together were better never conceived, unless, indeed, for adoption after the immediate operation. It encourages procrastination, and is almost certain to end in failure.

Take it all in all, I believe that there is not, in the entire range of gynæcological practice, a point more necessary to insist on than early closure of the perineal wound after parturition. This caution pertains rather to midwifery than to gynæcology; but it has such important bearing on the future happiness and comfort of a woman, when the labour has been long forgotten, that it warrants this stress being laid upon it.

Whatever operation be performed (I believe that of Lawson Tait to be one of the most perfect in principle, and not difficult of

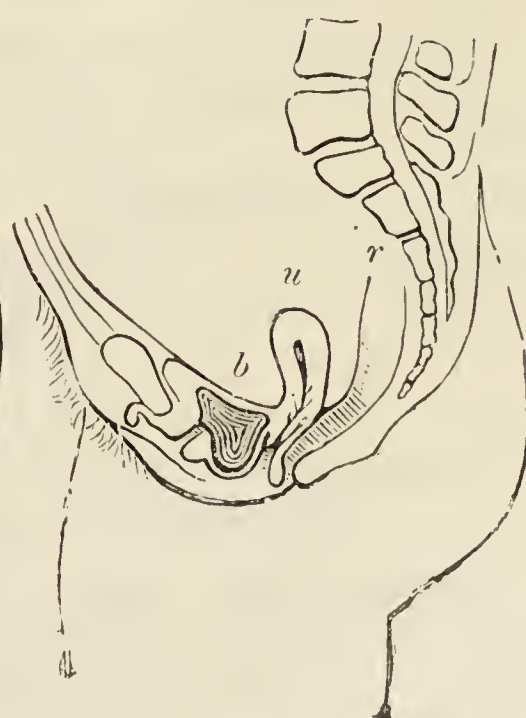
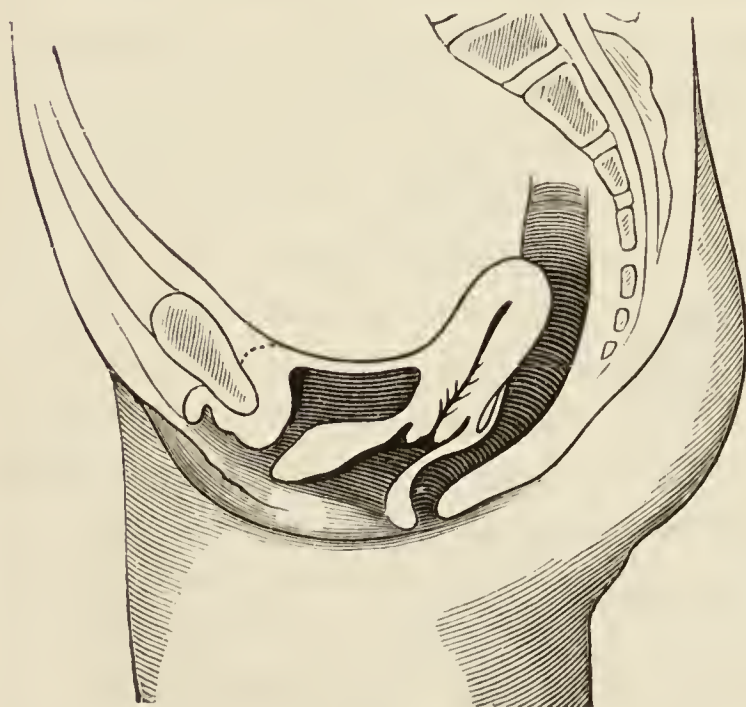


FIG. 203.—ABSENT PERINEUM WITH RETRO-VERSION. (AFTER A. MARTIN.)

FIG. 204.—RUPTURED PERINEUM AND CYSTOCELE. (AFTER A. MARTIN.)

execution), the objects are to denude the edges of the rent; to expose, posteriorly, two raw vaginal surfaces for union, so as to bring the rectum forward; to restore the action of the sphincter

and levator ani muscles; and to create, when necessary, a new perineum. The steps vary according as the operation is intended merely to rectify a partial or complete rupture. In the former case, the operation is a comparatively trivial one, whereas in the latter we have not alone to construct a perineal body and narrow the vagina, but also to re-establish the functions of the sphincter muscle.

Deferred Operation for Lacerated Perineum.

Appliances required.*—A straight scalpel; a pair of curved scissors; artery forceps, dissecting forceps, some various hæmostatic forceps; well curved needles of different sizes; needle-holder; cumol-chromic and silkworm gut; a self-retaining catheter; a few vaginal retractors; some perineal hooks; leg supports (should a suitable table not be at hand). Two assistants, one nurse (it is well to have a second if possible), and an anæsthetist are always required.

In all vaginal operations the usual aseptic precautions are taken before the patient is placed on the table, and the hair of the vulva, and that in the vicinity of the perineal wound, is carefully shaved. Mere cutting off of the hair with scissors at the time of the operation is not sufficient. It is better to commence the disinfection of the vagina the day before (*vide* chapter on Asepsis). The bowel also ought to be well emptied by an aperient and enema.

The patient is placed opposite a good light, and in the lithotomy position, the buttocks being brought well to the edge of the operating table. Should this not be provided with the ordinary leg supports, each knee of the patient is held apart by an assistant, who controls it with his arm, while at the same time he draws out the labium of that side with a hook or



FIG. 205.—SELF-RETAINING CATHETER.
(SKENE-GOODMAN.)

small blunt rake. As the operation may be tedious, the feet and legs of the patient should be protected from the cold by domette bandages carried as far as the knees. The surgeon next introduces two fingers of the left hand into the rectum, and puts the mucous membrane on the stretch. [I include here the steps required

* The various needles, needle-holders, scissors, and other appliances required for all these plastic operations on the vagina and associated operations on the cervix, are all shown in the text.

presuming the rent to extend as far as the anus.] The operation is commenced by paring off with knife, or scissors, or both, the rectal margin of the mucous membrane, and continuing the dissection by removal of a layer of the mucous lining of the posterior wall of the vagina to the extent of an inch and a half. The lateral margins are now attacked in a similar manner, until a triangular raw surface at either side of the labium is exposed, of about one inch in breadth, and over an inch and a half in length. Bleeding is readily controlled by hæmostatic forceps or Zweifel's miniature angiotribe, and the use of very hot water. The raw surface at one side should be an exact counterpart of that on the other. The extent of the denudation, anteriorly and posteriorly, will depend on that of the laceration. The surgeon now prepares to pass the sutures. A sharply curved needle, held in a needle-holder, armed with a thread of silver wire, kangaroo or silkworm gut, is passed from the lower margin, and half an inch to the outer margin of the anus, deeply upwards, across the recto-vaginal septum, well in front of and above the bowel orifice, and is brought with a sweep of the needle down and out, at a corresponding point at the opposite side. This is Emmet's suture. When passed nothing should be seen of the thread save the two ends. This suture is next secured. The perineum is now closed by sutures. The safest plan is to pass the first few unexposed, through the recto-vaginal septum. The last few passed will be partly exposed on the vaginal side of the rent. Some operators prefer to secure the suture with perforated shot. The wound is cleaned and sponged; the thighs are brought together, the patient is placed on her back, and the urine is drawn off every six hours. [*I much prefer to draw off the urine rather than trust to a retained catheter.* Unless with a very careful and experienced nurse, self-retaining catheters are dangerous; they are apt to slip out and endanger the success of the operation. A short-winged rubber female catheter, with a tube attached, is simple and safe; the tube is closed by a small clip.] The bowels may at first be locked with opium, and simple but nourishing food given. They need not be moved until the sixth or seventh day. This may be effected by first filling the rectum with olive oil, this being followed, after an interval, by an injection of olive oil with soap and water; after this has acted, the rectal stitch may be removed. The patient must keep her bed for a fortnight, and it is well to have the knees bound together. I have had equally good results by the administration, every other day, of an olive-oil enema. In fact, it is the plan that I generally

adopt. We get rid of the unpleasant complication of the locked bowel, and the risk attendant upon the passing of hard fæcal masses, with the consequent rectal irritation. Perfect cleanliness must be enforced after the operation, and the vagina should be carefully washed out each day with tepid permanganate of potash solution. It is well to keep a dry thymol pad over the wound, with a light perineal bandage.

Tait's Operation.—I am indebted to the late distinguished gynæ-

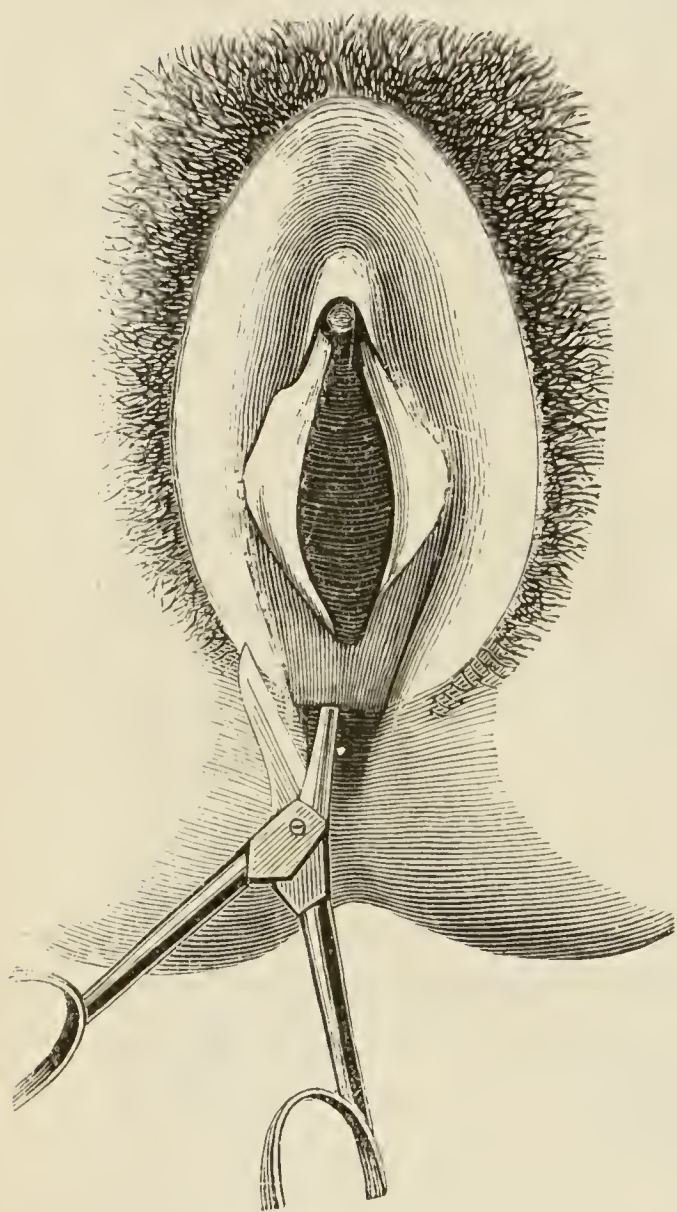


FIG. 206.—SPLITTING THE RECTO-VAGINAL SEPTUM.

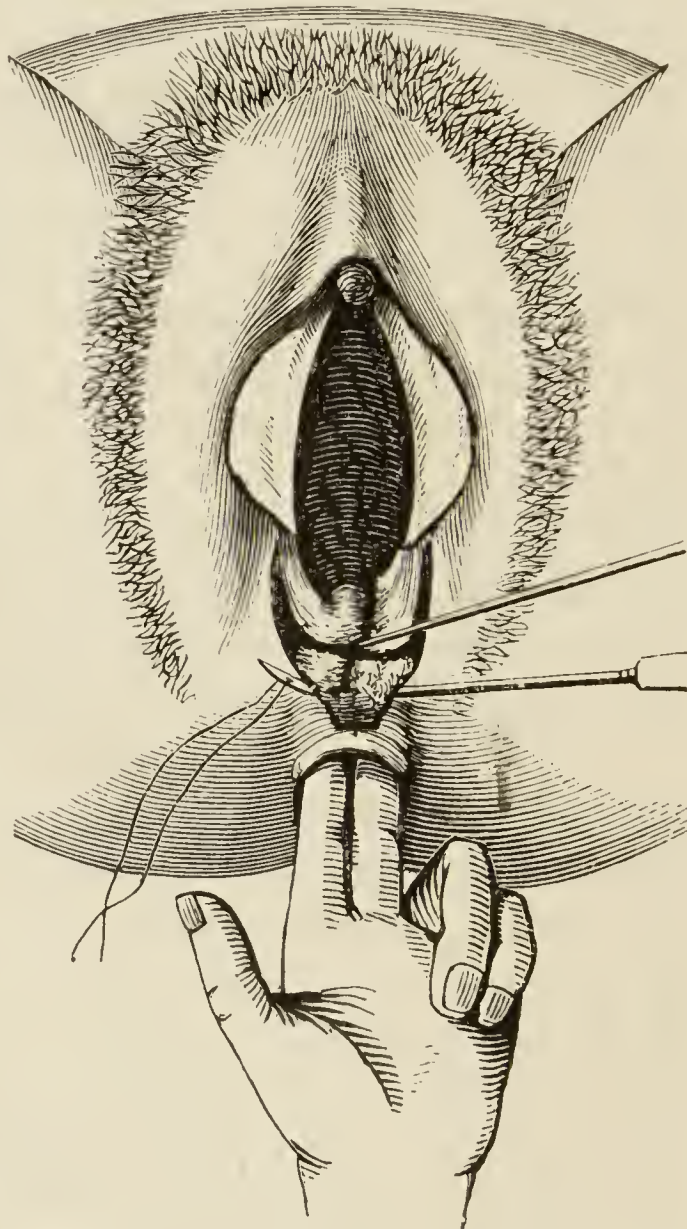


FIG. 207.—PASSAGE OF THE SUTURE.

These three drawings (Figs. 206, 207, 208) were made for Fancourt Barnes by Professor Vulliet, of Geneva.

cologist for the following description of his operations, which he kindly wrote for a previous edition of this work.

‘The operations are of two kinds. The first I term extension of the perineum from behind forwards, and for this I make, by means of a sharp pair of pointed scissors, a horseshoe incision round the perineum, the horns extending

as far forwards as I judge to be necessary. It is made deeply into the substance of the labia on each side, and when its flaps are separated it makes a V-shaped groove on each side. As many silkworm-gut sutures as seem necessary—generally three or four—are inserted by a handled needle, the needle entering well within the margin of the wound, so as to open out the V completely and evert its lips. The outer flaps of each V on the several sides are turned outwards, and the inner turned correspondingly inwards; and when the stitches are tightened they are in this way approximated as plane surfaces, and so they unite, making a very firm and thick platform for the displaced organs to rest upon, and this rarely gives way. I generally now leave the sutures in for three or four weeks.

‘For torn perineum the operation again is the same in principle, though different in detail. When the marginal folds of the buttocks are fully drawn asunder in such a case, the old tear is displayed by a thin white line of cicatrix extending transversely to the axis of the rent, which of course was at right angles to the plane of the perineum. The healing of the tear has taken another direction altogether, and we have the cicatrix at right angles to the wound. This is, so far as I can think out the question or know the facts, wholly unique in its occurrence. It forms the basis of the principle of the operation which I perform, and that is absolutely the opposite of the principle of all denuding operations. *The scheme of my operation is to restore the old rent and unite it at right angles to its representative cicatrix, that is, at right angles to the plane of the perineum.* In this way, and in this way only, can the perineum be truly restored, and from this operation alone can it be hoped that the restoration will stand the attacks of subsequent labours, as a large number of my restorations have done. I do not know one having been torn a second time.

‘Having the folds of the buttocks pulled firmly apart, so that the cicatrix is put on the stretch, I enter the point at its extreme edge on one side, and, keeping strictly to its line, I run through to its other extremity. The incision

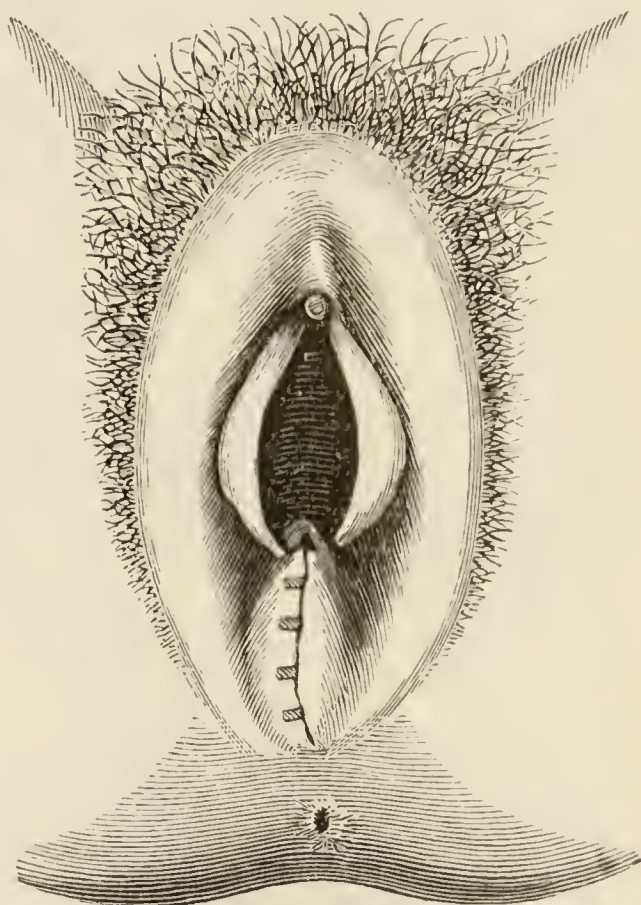


FIG. 208.—WOUND CLOSED.

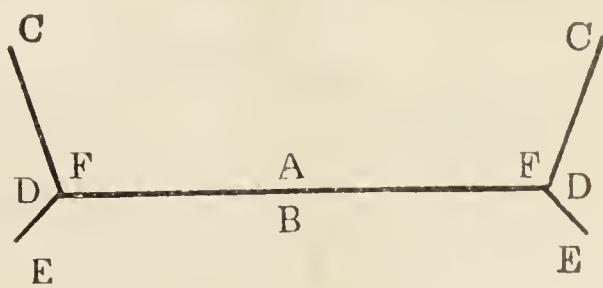


FIG. 209.—D to E, rectal incisions; F to C, vulvar incisions; D to D marks the line joining the vulvar and anal rents.

is about three-eighths of an inch deep, and it forms two flaps, a rectal and a vaginal. From each end of the incision it is carried forward into the tissue of each labia for about an inch, and again backwards for about a third of an inch, making a wound like this—

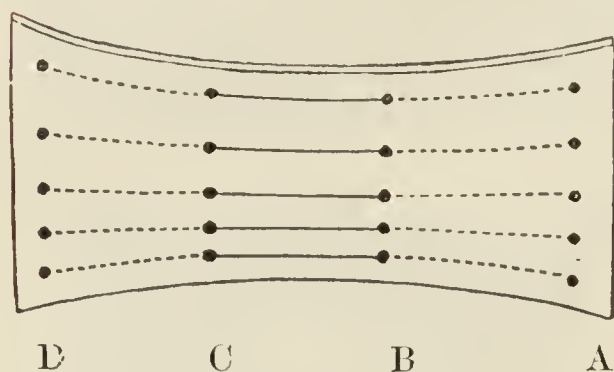


FIG. 210.

The vaginal flap A is held upwards (the patient being on her back), and the rectal flap B being turned downwards, the angles A F C being pulled by forceps diagonally upwards and inwards towards the middle line, and the angles B D E being pulled downwards and inwards. The line C E thus becomes straight, and the wound takes the form shown in Fig. 210.

By means of a stout-handled and well-curved needle the silkworm-gut

sutures are entered on one side about an eighth of an inch within the margin of the wound (so as not to include the skin) at the dots A. They are buried deeply in the tissue as far as B, and then the needle is made to emerge so as to miss the angle of the wound. The needle again enters at the large dots C and emerges at the dots D. By thus missing the upper or deep angle of the wound between B and C, the two great and divided masses of the old perineum, which lie in the parallelograms respectively bounded by the lines of large dots A—B and C—D, are accurately adapted. The rectal and vaginal flaps respectively point into the rectum and vagina, and, like an old-fashioned flap-valve, prevent noxious material entering the wound. The resulting mass of perineum is amazingly large; union is

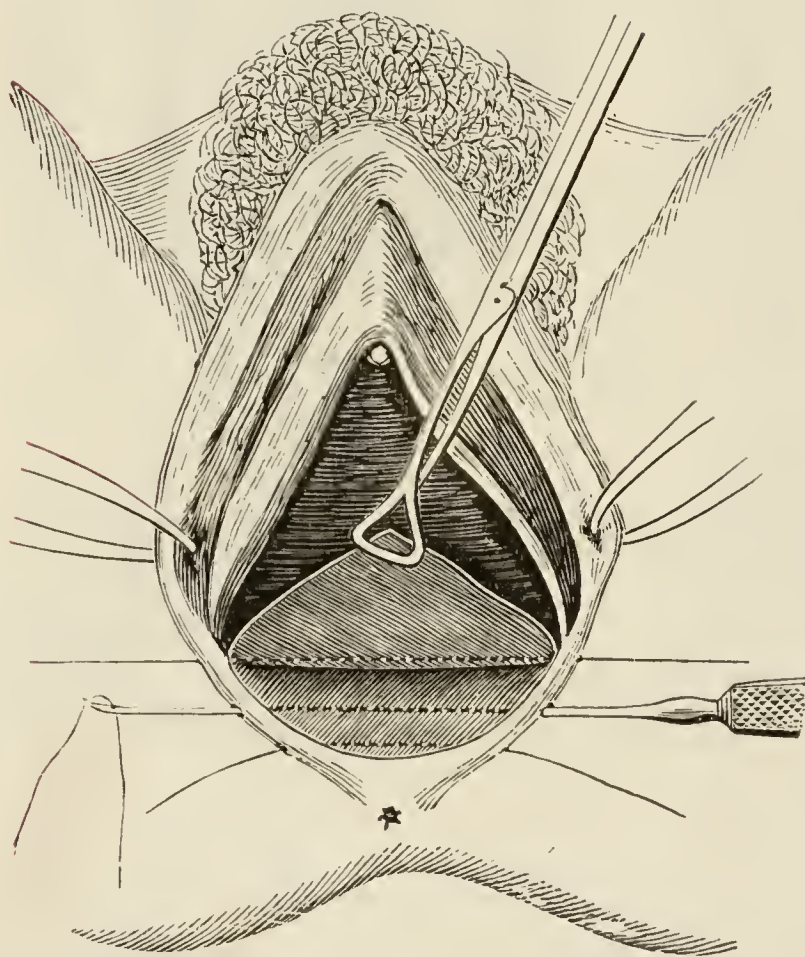


FIG. 211.* — DOLÉRI'S MODIFICATION OF TAIT'S OPERATION. RAISING OF THE SEMILUNAR FOLD, AND INTRODUCTION OF THE SUTURES. (BONNET AND PETIT.)

The vaginal flap is resected above the line of the suture shown in the drawing, and thus the closure of the vaginal denuded surface, and the remaining portion of the raised tongue of mucous membrane, is secured.

almost inevitable, for I have failed only twice in many hundreds of cases, and

* See also page 298.

then because there had been previous denuding operations. The resulting cicatrix is absolutely linear, and so resembles the natural raphe, that in three or four months after the operation it is quite impossible to determine, from the appearance of the parts, that the perineum has ever been injured, for there are no stitch-hole marks left to tell the story. The pain experienced after the operation is trifling compared to the old method of quilled or slotted suture. *I leave the stitches in for three or four weeks, and take great care that the rectum and vagina are washed out twice daily* (Lawson Tait).

Operation for Relaxed Vaginal Outlet.

Kelly performs for the cure of this condition a bi-lateral symmetrical operation, based upon the principle of that of Emmet. For a more complete description of Kelly's procedure I must refer the reader to his work on 'Operative Gynæcology.'* The steps are as follows:—

The operation consists in free denudation (the form and size depending on the degree of relaxation) of two triangular surfaces on the vaginal sulci at either side, the outline being completed by a semi-circular incision extending around the posterior wall from a point within the hymen above, and embracing any scarred tissue below. A large wound area is thus left, on which is seen a narrow undenuded area between the two triangles. The denudation is effected with curved scissors, the whole thickness of the vaginal wall being removed in strips from one-tenth to a fifth of an inch broad. Hæmorrhage is checked in the usual manner, and, if necessary, buried sutures are used. Approximation is secured with silkworm-gut and catgut sutures. The mucosa of each triangle is united at either side with the strip of undenuded tissue in the centre, and thus each vaginal sulcus which has been denuded is closed, and the edges of the remaining raw area below this are brought together by a suture of silkworm-gut which embraces the upper angles on the sides, and transfixes the rectocele.

Howard Kelly ridicules what he terms the mechanical theory of the so-called perineal body being the support of the vagina and uterus. The real supporting mechanism of the outlet, he says, is not the perineal body, but the anterior portion of the levator ani muscle. Rising on either side of the pubic ramus, and passing back round the lateral vaginal wall, it unites with its fellow behind the rectum, its fibres being intimately interwoven with the lateral walls of the rectum. The vaginal introitus is but a narrow chink between this posterior muscular band and the pubic arch. It has no direct means of closure such as would be afforded by a powerful sphincter muscle. The levator muscle indirectly supports it. By its contraction the lower end of the rectum is lifted up under the pubic arch, and the vagina is flattened out and held up between the two, the position of the plane of the pubic arch rendering the closure

* 'Operative Gynæcology,' by Howard A. Kelly, 2 vols., 1898.

more efficient. This arrangement it is which gives the sigmoid curve to the lower extremity of the virgin vagina.

The fact that, notwithstanding the absence of the perineum, prolapse of the vagina and uterus but rarely occurs, Kelly contends is irreconcilable with the view that the function of the perineum is to plug the pelvic outlet 'like a cork.' As the tear extends generally along the median line, the lower fibres of the levator ani

muscle are uninjured, and hence prolapse does not occur. This is not the case when the tear branches laterally.

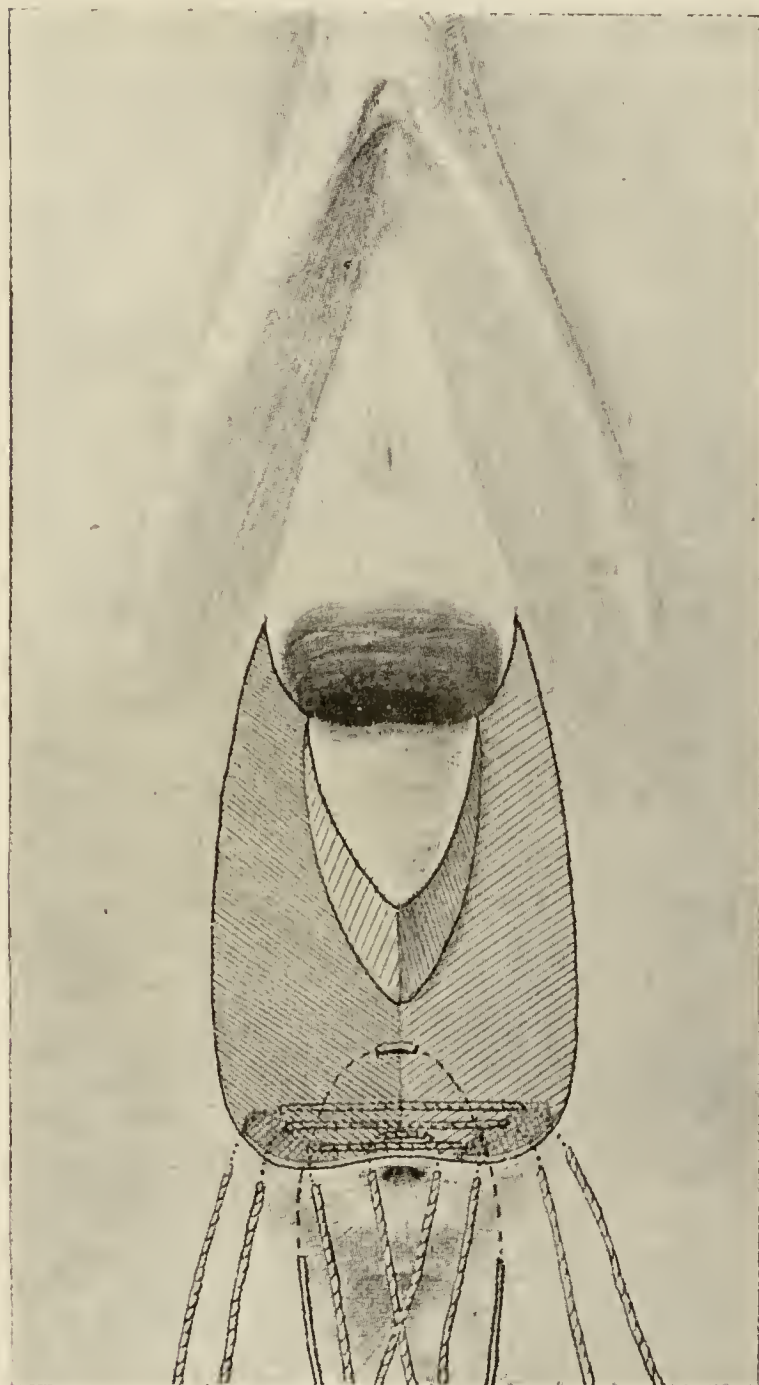


FIG. 212.—RECTAL SUTURES NOT TIED.
(HOWARD KELLY.)

Silkworm-gut suture shown passing well through the septum from behind the sphincter at either side.

of the sphincter ends is caught up with tissue-forceps and cut free with curved scissors. The denudation is continued around the sharp edge of the septum to the opposite end of the sphincter, which is denuded in the same way, taking care to remove all scar tissue. A second strip above, and parallel

Howard Kelly's Operation for Complete Tear of the Recto - Vaginal Septum. — The steps of the operation are as follows :—

'The area to be denuded must be outlined with the scalpel, which follows the direction of the scar tissue in a general way, greatly exaggerating its outlines; the cardinal principle in the denudation is to reproduce as nearly as possible the original injury.

'The first incision splits the septum and includes the sphincter ends, from which a line is continued up under the pubic arch on either side; thence it goes down into each vaginal sulcus and back again, meeting in front of the posterior column, 1 to 2 centimetres ($\frac{2}{5}$ to $\frac{1}{2}$ inch) above the first incision in the septum. All of the tissue included within the outline is now removed. One

to this, is next cut off; and a third, and so on, continuing the denudation up into the vagina until the whole area within the outline has been removed. It is important to bear in mind that the denudation within the vagina must extend a centimetre or more ($\frac{1}{2}$ inch) above the angle of the tear, in order to

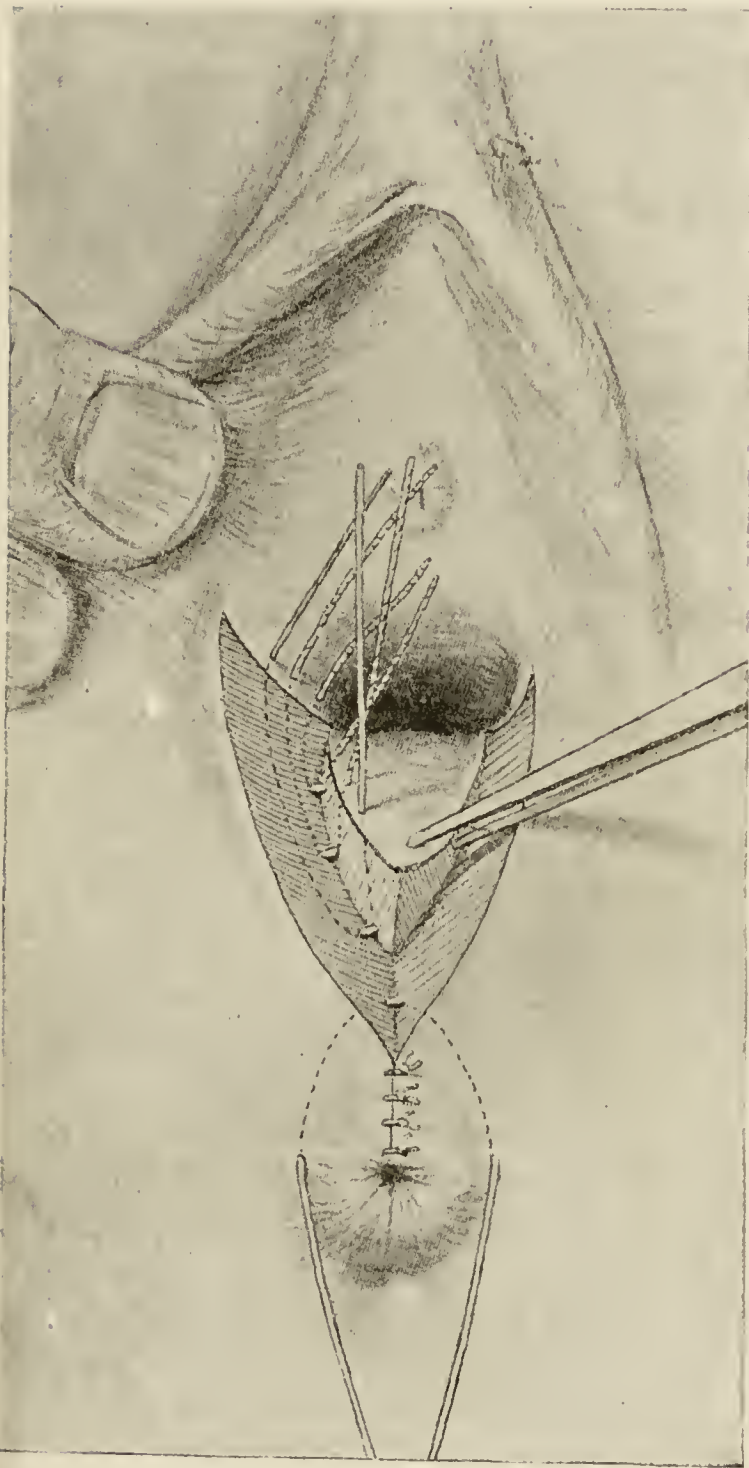


FIG. 213.—COMPLETE TEAR OF THE RECTO-VAGINAL SEPTUM. (HOWARD KELLY.)

Rectal sutures all tied except the silkworm-gut tension suture. The sutures are shown introduced in the right vaginal sulcus.

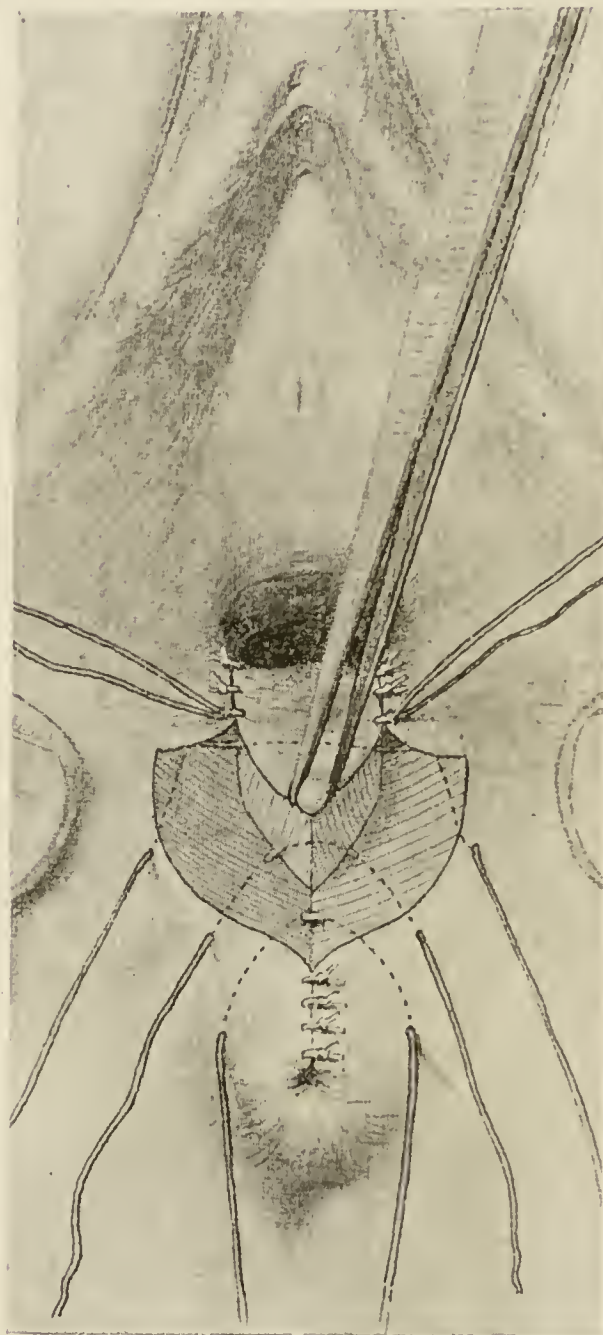


FIG. 214.—RECTAL AND VAGINAL SUTURES ALL TIED. (HOWARD KELLY.)

Perineal sutures introduced, but not tied.

avoid the tendency to form a recto-vaginal fistula at this point. Silkworm-gut and catgut sutures are best adapted to the approximation of the denuded surfaces. Half-deep sutures of catgut are preferable for closing the rectal side of the tear, and for securing accurate approximation between the

silkworm-gut sutures, which are used at wider intervals. The complication of the torn bowel is first disposed of by a series of interrupted rectal sutures, commencing at the upper angle of the tear, entering each suture at the margin of the rectal mucosa, and emerging on the wound surface 4 to 5 millimetres ($\frac{1}{10}$ to $\frac{2}{5}$ inch distant), re-entering on the opposite side and coming out again on the margin of the mucosa, at a point corresponding to that of its entrance. This suture may be tied at once, and dropped into the rectum; and a little less than a half centimetre ($\frac{1}{2}$ inch) below this, another suture is passed in like manner, tied, and dropped, and so on until the whole of the rectal rent has been obliterated down to the sphincter. One of the most important points in the operation now is to secure an accurate approximation of the sphincter ends by two or three sutures radiating from the rectum out on to the skin surface. The contractions of the sphincter render it necessary to assist these sutures with one of silkworm-gut introduced well behind to the denuded ends, and passing up through the septum. When this has been done the rectal rent is repaired, the wound is reduced from a complicated one involving three surfaces—rectum, skin, and vagina—to a simpler wound involving vagina and skin perineum.

Dolérís' Operation.—Dolérís performs a further modification of Tait's operation, which he styles 'Colpoperinéoplastie par glissement.' The minute steps of this operation it is not necessary to describe here. The vaginal flap, having been raised and bared, is brought at the middle point of its base to

the centre of the cutaneous margin of the wound. The flap is then fixed in its new position by a series of sutures, three in number, carried from the cutaneous margin through the lower border of the vaginal flap from one side to the other, beginning in the centre. A final terminal purse-string suture of the nature before referred to is passed so as to secure complete and deep adaptation of the tissues.

In grave cases, in which there is also prolapse of the vagina, Dührssen combines the three steps, vaginal fixation, anterior colporrhaphy, and perineorrhaphy, but Edge advocates double lateral colporrhaphy, combined with vaginal fixation and perineorrhaphy—

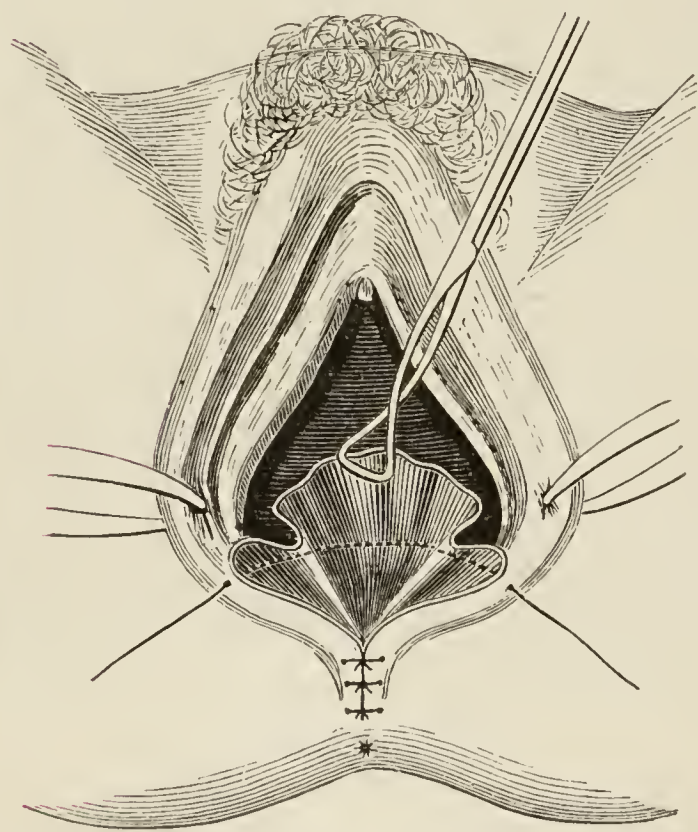


FIG. 215. — 'COLPOPERINÉOPLASTIE PAR GLISSEMENT,' SHOWING THE TERMINAL PURSE-STRING SUTURE. (BONNET AND PETIT.)

and vulva; thirdly, vaginal fixation as far as the insertion of the sutures; fourthly, double lateral colporrhaphy as far as insertion of the sutures;

fifthly, tying of both sets of sutures. Continuous sutures of the finest silk are used for the colporrhaphy. The vaginal fixation sutures are removed after six or eight weeks, the perineal after a month.

Operations for Vaginal Prolapse.—The operations for prolapse of the vaginal wall may be considered in connection with prolapse of the uterus. This vaginal prolapse may be attended by a rectocele or a cystocele. In the one case, the rectum protrudes into the vaginal canal, and may be dragged down with it outside the vulvar orifice. In the other, the bladder accompanies the prolapse, frequently occupying portions of the procident mass. The position and direction of the urethra is altered (Figs. 195, 196).

The pathology of this condition we have considered in relation to prolapse of the uterus.* There is little difficulty in detecting either anomaly. A soft bulging swelling is felt, posteriorly or anteriorly, pressing into the vaginal canal, or appearing at the vulva, and the diagnosis is further verified by introducing the left forefinger into the rectum, while the right is made to oppose it from the vaginal surface. The catheter or sound may be used for a similar object in the instance of a cystocele.

Operations intended to produce Contraction of the Vaginal Canal—Colporrhaphy.—The principle of this operative procedure consists in the removal from the vagina of portions of the mucous membrane from the anterior, lateral, or posterior wall, or from all three. The shape and extent of the portions removed will depend upon the nature of the individual case and the degree of prolapse.

The simplest of operative measures is that of Marion Sims. It consists of the following steps: First, the anterior wall of the vagina (which is the primarily prolapsing portion) is hooked up and down well towards the posterior wall; secondly, with Emmet's or Sims' scissors, a V- or trowel-shaped portion of the mucous membrane is removed, the apex at the neck of the bladder, and the arms extending to the sides of the cervix uteri; thirdly, the denuded surfaces are brought together by sutures (of silver wire or silkworm-gut) passed transversely. Sims, in his later operations, left a small portion of undenuded tissue at (*e*) to permit the escape of any pent-up secretion (Fig. 216).

It has to be remembered that we have four distinct abnormal states to consider in connection with this operation: relaxation of the uterine supports or ligaments, primary prolapse of the vagina (antecedent to the prolapsus uteri), hypertrophic elongation of the cervix, and prolapsus uteri. Associated with the descent of the uterus are the two fundamental errors—want of vaginal support, and uterine traction. Increase of uterine weight is the third most

* Pages 278–290; also see chapter Anatomical and Clinical.

important factor. Any operation which can carry with it the assurance of correcting all these conditions is the only one that can give a guarantee of any permanent result.

The denudation of the vaginal mucous membrane may be effected with either scissors or the colporrhaphy knife (Fig. 217). I employ both instruments at different stages of the operation. Good gut ligatures are the best to use. Simon performed anterior colporrhaphy by the removal of an oval portion of the vaginal mucous membrane, the poles of the oval being pointed and brought to an acute angle. The long diameter of the denuded surface corresponds to the relaxed portion of the vaginal wall. The shape of the flaps, however, must depend in a great measure upon the size and situation of the prolapse. The boundaries of the apex, base, and sides of the proposed raw surface are limited by fixing forceps. The number and direction of the sutures will depend upon the size and shape of the colporrhaphy. In all these

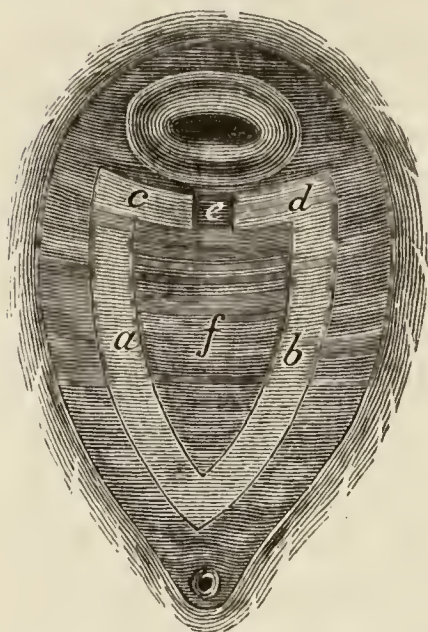


FIG. 216.—SIMS' COLPORRHAPHY.

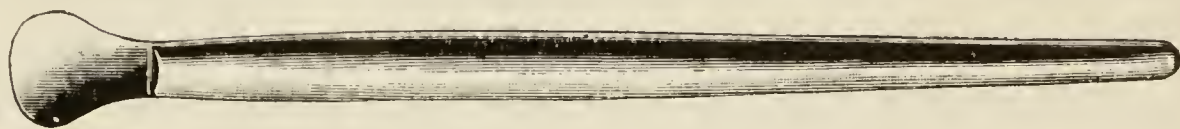


FIG. 217.—COLPORRHAPHY KNIFE OF MARTIN.

operations it is essential to operate with celerity, and to restrain the hæmorrhage by irrigation with hot water.

Gerstung,* on the theory that vaginal cystocele is the result of either laceration or extreme stretching of the vesico-vaginal fascia, on which the bladder rests, recommends that the anterior vaginal wall be split in its whole length, and that the part of the bladder-wall which prolapses be pushed towards the interior of the bladder; then by means of numerous sutures the paravesical cellular tissue or fascia to be drawn together in a long fold or plait, so as to form a sure support for the vesical wall. The vaginal incision is then closed.

Colpoperineorrhaphy.—Various procedures are practised with a view of curing a rectocele and a prolapse of the vagina. When such a prolapse occurs with a lacerated or deficient perineum, colpoperineorrhaphy is performed.

* *Centralb. f. Gyn.*, Feb., 1897.

The principle of **Reamy's operation** is shown in Fig. 220. The desired extent of surface of the posterior wall of the vagina is denuded, as shown in the drawing, two arms of the wound being carried upwards and outwards at

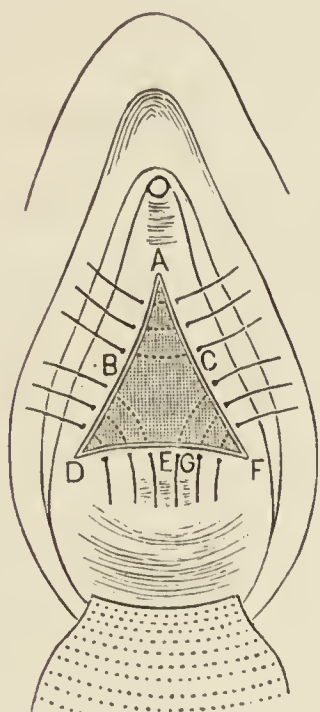


FIG. 218.—ANTERIOR COLPORRHAPHY, SHOWING THE SUTURES THAT CLOSE THE THIN ANGLES. (DOLÉRIS.)



FIG. 219.—ANTERIOR COLPORRHAPHY, SHOWING THE PASSAGE OF THE FINAL SUTURE, *u, r, x, y*. (DOLÉRIS.)

each side of the cervix. Catgut ligatures are used. A most important suture is that shown by the dotted lines crossing the upper wings of the wound; this suture is carried from the angle formed by one extending arm

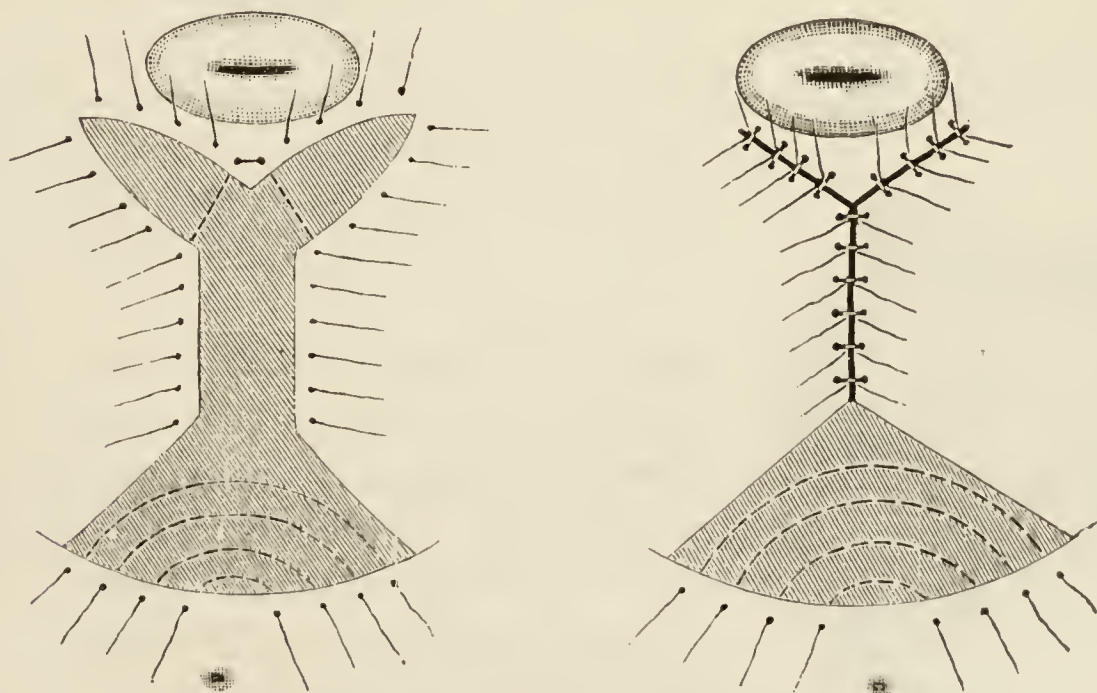


FIG. 220.—REAMY'S OPERATION FOR RECTOCELE.

with the denuded surface on the posterior wall, to the angle of undenuded surface beneath the cervix. It is drawn out here and reintroduced at a corresponding point of the apex, about one-fourth of an inch from its point of

emergence, and is carried across the denuded arm. It is brought out a quarter of an inch from the margin at a corresponding spot (in the opposite

angle) to the point of entrance. This suture brings the three angles of the wound together (Fig. 220).

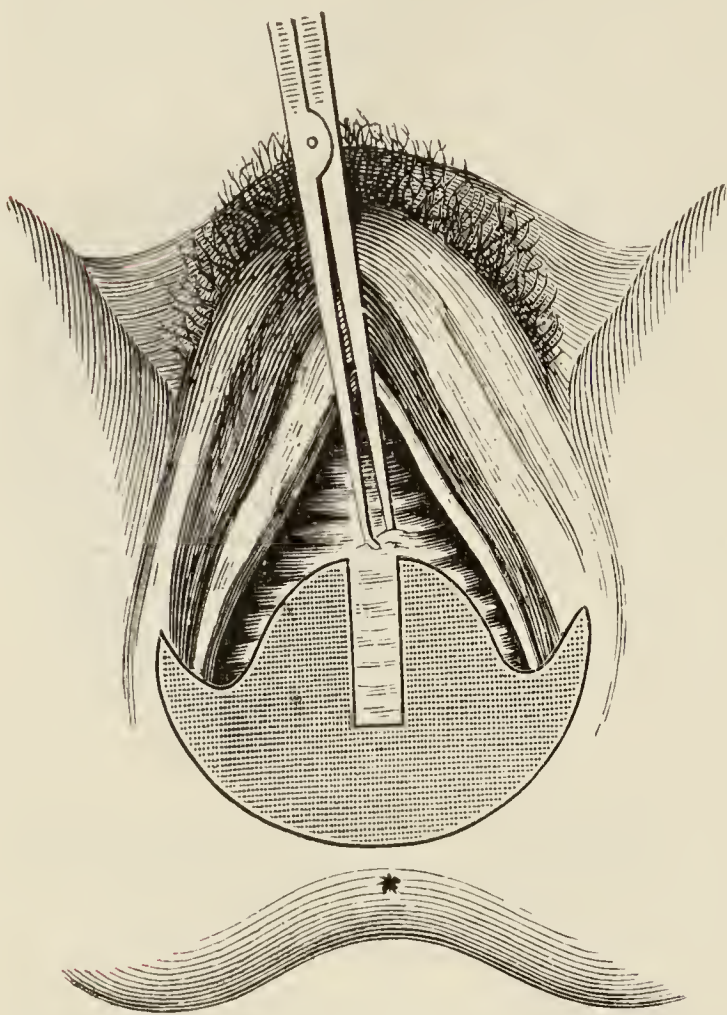


FIG. 221.—COLPOPERINEORRHAPHY.
(MARTIN'S METHOD.)

The form of **Hegar's operation** is triangular, with the apex at the neck of the uterus, and the base at the perineum. That of **Martin** is shown in Fig. 221. The denuded surface is divided into two portions by a column of mucous membrane, which he purposely leaves. Martin closes the vaginal wound before he vivifies the perineal edges. There is danger of non-union occurring through the untouched central column of mucous membrane.

Sims' Amputation of the Cervix.—This operation is more frequently performed on those advanced in life. The best method of removal is by means of the knife or

scissors. The stump is covered with the vaginal tissue by means of silver sutures, four to six, passed from before backwards through the cut edges of the vagina. Thus a small oval opening corresponding to the cervical canal is left.

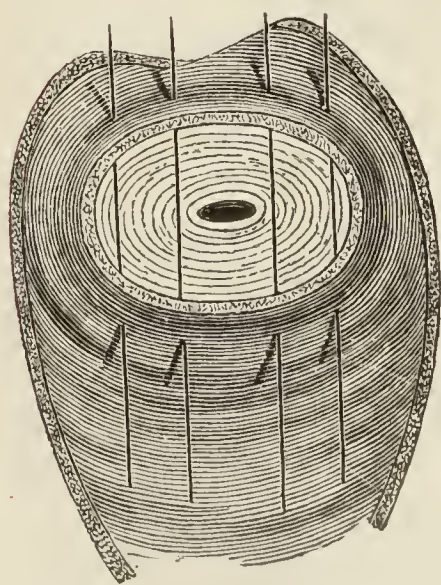


FIG. 222.—AMPUTATION OF
THE CERVIX. (SIMS.)

Emmet drew particular attention to the evils which accrue to the woman if the stump be allowed to heal by granulation. These are partially due to contraction or closure of the uterine canal and subsequent re-enlargement of the uterus, and partly to reflex irritations and the effects on nutrition.

Schröder's Operation.—For this we require a duckbill speculum; two vaginal retractors; two long-toothed forceps; two scalpels, with short broad blades; a pair of straight and strong scissors; a dozen small hæmostatic forceps, including two of Kocher's and two of

Zweifel's small angiotribes; a few toothed forceps; an irrigator; special needles, flat and curved, with needle-holder; catgut and silver wire; and a receptacle for the irrigating fluid. The neck, which is drawn down and held firmly by an assistant, is bilaterally divided as far as the vaginal fold. The divided lips are then well separated, and a curved incision, with the convexity anteriorly, is made at each angle. Another semicircular incision is now carried to the depth of some millimetres through the uterine tissue, from one angle of the denuded anterior lip to the other; and the bistoury being then turned flat in the groove, it is carried through the uterine neck at right angles to the transverse incision,

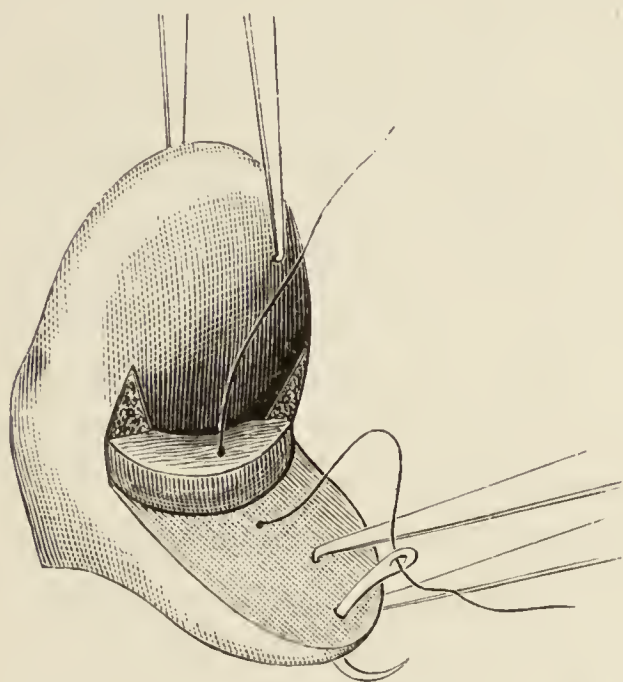


FIG. 223.—SCHRÖDER'S OPERATION OF AMPUTATION OF VAGINAL CERVIX, SHOWING THE TRACK OF THE CENTRAL SUTURE ACROSS THE EXSECTED LIPS. (BONNET AND PETIT.)

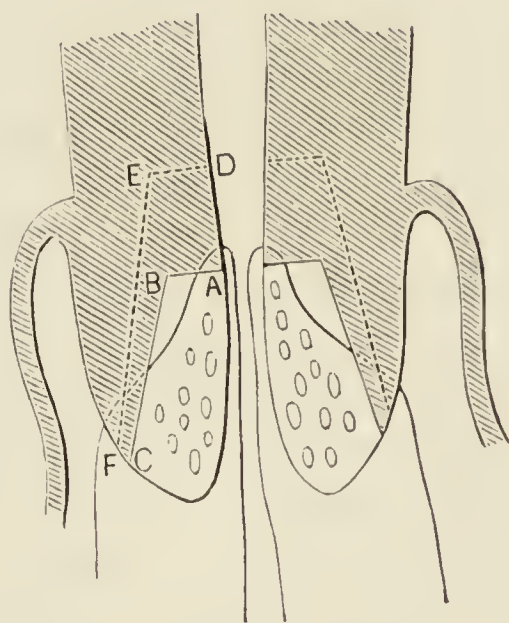


FIG. 224.—SECTIONAL VIEW OF SAME. A, B, C, exposed surfaces of flap; D, E, F, track of supra-vaginal incision; A, F, suture.

leaving thus a raw surface, as shown in the figure. This angle is then united by three sutures. The curved needle of Sims is carried in the manner shown in the drawing beneath the exposed surfaces, entering at a short distance from the margin of the first incision, and emerging at the upper third of the larger flap, to be re-entered again at the lower third. The central suture, before tying, is shown in Fig. 223. This one is first inserted: the three are caught in a torsion forceps, and left, while the anterior lip is being treated in the same manner. When the two denuded lips have been sutured they are drawn asunder by the threads, and the borders of the lateral incision are freshened. These are next carefully united at either side by suture. Atresia is prevented by securing the exact

adjustment of the cervical and vaginal mucous surfaces of both lips and by preventing any intervening protrusions between the sutured points. Also the external os uteri is made slightly larger than natural, and is kept open at the close of the operation by the insertion of some iodoform gauze.

Martin's Operation.—The cervix having been seized with two tenacula, or by a few strong threads of silk which are passed through and tied, is drawn well down. An anterior incision is carried across the uterine wall, and the mucous membrane raised as far as the vaginal vault, avoiding the bladder and the peritoneum. Two lateral incisions are now made, dividing the uterine neck as far as either extremity of the transverse cut. The anterior flap is formed by a triangular incision through the anterior uterine wall, which is thus excised. The mucous membrane is now stitched with a series of catgut sutures to the uterine mucosa. The posterior flap is made in a similar fashion, and it also is united to the mucosa. Other sutures are passed laterally, bringing the mucous membrane together, and leaving the opening of the uterine canal at the most dependent part. The operation may then be amplified by lateral anterior and posterior colporrhaphy, or, after thorough disinfection of the hands, ventro-fixation may be performed.

Simon Markwald operates by the removal of a cone-shaped portion of each lip, with the base below. These two flaps are united by catgut sutures, and the lateral incisions are brought together as in **Schröder's** operation.

Other operative procedures practised in extreme cases of vaginal procidentia, are *episiorrhaphy* (Le Fort), *fixation of the vagina* (Péan), *colpohysteropexy* (Sänger, Nicolétis, Richelot), *colpectomy* (Müller).

Episiorrhaphy is closure of the vaginal opening. It may be occluded to the extent of complete closure, a space being left for the passage of the urine; or it may only be so contracted as to permit coitus. Le Fort bares two rectangular surfaces—one on the anterior, and the other on the posterior, wall of the vagina, and unites these by sutures. Péan fixed the vagina to the rectum behind, and to the bladder in front. In **colpohysteropexy** the neck of the retroverted uterus is amputated, and the posterior vaginal wall is fixed to the anterior edge of the uterine stump. Three catgut sutures are used to attach the posterior half of the uterine stump to the posterior lip of the vaginal incision. Other sutures pass, at each side, from this same lip to the anterior edge of the uterine stump, and these include the vaginal mucous membrane, so as to cover the lateral portion of the uterine surface with it. The remaining margins of the vaginal wound are then brought together by sutures. The operations of Byford, v. Rabenan, and Jacobs, are but modifications of these methods (anterior and double colpohysteropexy).

Shortening of the Utero-Sacral Ligaments.

The structure of the utero-sacral ligaments has already been referred to. Schultze described these in 1881, and specially drew attention to their muscular structure. Passing from a little below the junction of the cervix to the body, these muscular bands in the folds of Douglas reach to the lateral part of the sacrum at a level of the second vertebrae, losing themselves in the muscular wall of the rectum, and in the sub-serous connective tissue. Some muscular fibres coalesce and form Luschka's *musculus retractor uteri*, this being their lower insertion. Relaxation of, or injury to, these utero-sacral ligaments tends to produce both retro-displacement and prolapse. As far back as 1850, Amussat brought about contraction of the posterior fornix by the application of caustic potash and the actual cautery. By various methods, both by the abdomen and vagina, Herrick, Byford, Frommel, Freund, Säger, Wertheim, and Mandl have successfully operated, but attention had been more prominently drawn to this method by Bovée, who shortened the utero-sacral ligaments through the vagina in 1897, and later, in 1900, attacked them by the abdominal route. Jessett brought the subject before the British Gynæcological Society. He advocated posterior fixation of the cervix with ventro-fixation, and Stanmore Bishop reviewed the entire subject,* describing the technique of the operation as performed by him. In Bovée's vaginal operation, the posterior lip of the cervix is grasped with a volsellum and drawn forward, an antero-posterior incision is carried through all the structures of the posterior fornix, avoiding the peritoneum, and extending from the cervix to the rectum. The ligaments are then exposed by dissection, and both are treated thus: They are grasped with a forceps midway between the extreme points to be united, and a fold of a ligament is brought into the vagina, the traction on the cervix being relaxed. A curved needle, armed with kangaroo tendon, is passed through the ligament at the extreme points, and another through the loop thus formed, including the posterior portion of the cervix below the insertion of the ligaments. The deep sutures are first tied, and then the others. The wound is now spread well open, and the two ends are brought together by a continuous suture. Occasionally, Bovée separates the anterior vaginal wall from the uterus, and transplants the former higher up

* *Brit. Gyn. Jour.*, Feb., 1903.

to it. Should adhesions exist in the posterior cul-de-sac, he opens this and separates them. Through the anterior fornix he also shortens the round ligaments.

Should he follow the abdominal route, he adopts the Trendelenburg position, and removing the intestine with the omentum out of the way, by a specially long retractor he draws the uterus well forwards and upwards. Having with the fingers carefully located the utero-sacral ligaments, a longitudinal incision is made near the inner margin of one of them, through the peritoneum, which is then partially dissected loose, and a fold of it, together with the loop formed as in the vaginal operation, is treated as in the latter technique. The peritoneum is closed by a purse-string suture, or by the method adopted in closing the vaginal wound. The same technique is followed with the other ligament, and the abdomen is then closed.

Where the vaginal route is chosen, if the round ligaments are not shortened, the abdomen is not opened.

Stanmore Bishop selects the aponeurotic structures covering the anterior surface of the sacrum for the attachment of the cervix, carefully avoiding the ureter and rectum, and the nerve strands. He selects a point between the rectum on the inner, and the ureter on the outer, side, which is fairly free from vessels. His technique is as follows:—

The extreme Trendelenburg position is adopted. The uterus and broad ligaments being isolated from the intestines, two threads, one on either side of the uterus, are passed through the broad ligament, and enclosing the tube and round ligament. These are used as tractors to draw the uterus forwards. An obturator or flattened uterine sound is passed into the vagina by an assistant, and carried against the posterior fornix so as to render it prominent. 'On either side a stout silk thread is passed vertically through the substance of the fornix, avoiding the mucous lining, so that each protruding end is half an inch distant from the other, and the whole loop one-third of an inch from the cervix. The fornix is now applied in the position just described, and the needle carrying the suture is entered deeply, embracing the periosteum covering the sacrum, being brought out again half an inch directly above its point of entrance. A narrow strip of peritoneum is next removed from the portion of the fornix lying in the grip of the suture, so as to bare the connective tissue. The same plan is pursued at the opposite side, and the sutures are then tied. The traction threads,

which have been passed through the broad ligaments, are now removed. 'The round ligaments are shortened, and the abdominal toilet is completed.' At a later sitting, if necessary, perineorrhaphy is performed.

Müller's Colpectomy.—In cases of complete vaginal prolapse, and in which the vagina is no longer required for physiological or sexual purposes, Peter Müller excises the whole vagina, and leaves the uterus intact. The operation is thus described by René Koenig (Berne):*—

'The cervix being drawn down, and the vagina unfolded, the mucous membrane is cut through about half an inch from the shallow recess left between the vagina and the labia minora. Then, beginning from this section, which is conducted round the vagina, the entire mucous membrane is stripped off—as a rule, an easy and rapid operation, a few strokes of the knife only being necessary, in addition to a steady traction, to scalp off the whole vagina. Should the cervix be hypertrophied, a clean cut with scissors or bistoury will remove it. *Now the bed of the removed vagina is columnized without regard to the uterus.* Beginning at the middle of the raw surface, the portions of the vagina immediately surrounding the cervix are approximated by means of a few stitches, over which two or three layers of sutures are put from side to side. It is not necessary to interrupt the suture after each layer has been completed, one continuous suture being sufficient for the whole operation, including the closing of the most superficial layer, the mucous membrane itself. As the suturing proceeds, the uterus recedes of itself. Should there be much bleeding, a few ligatures may be applied, but, as a rule, the hæmorrhage is readily checked by the continuous suture, if care be taken to include the bleeding vessel in the stitch.'

Koenig has performed colpectomy in women of advanced life without general anæsthesia. The operation is not a tedious one, being performed within fifteen minutes, and recovery is rapid. As to the consequences to the uterus, so far there has been no report of any accumulation of fluid or other effects, an atrophic condition usually resulting. He claims for the operation, simplicity, dispensation of anæsthetics, rapid recovery, impossibility of recurrence, and a maximum of safety.

* *Jour. Obstet. and Gyn. of Brit. Emp.*, Sept., 1903.

Hysterectomy with Colporrhaphy for Total Prolapse.

This operation originated principally in the Dresden Klinik, at the hands of Leopold and Wolff.

In regard to this radical procedure, which has not hitherto found many advocates in this country, we would quote the dictum of Wolff himself, viz.: '*The danger of a surgical proceeding should be at least not greater than the danger to life of the condition which the operation is destined to cure.*' When we find that a mortality of 16·6 per cent. followed the performance of the operation in the most capable hands, we may pause before advising so radical a measure for a condition which in itself is not dangerous to life, notwithstanding its consequences and inconveniences. To perform a grave and protracted operation on an aged patient with emphysema of the lungs, with cardiac hypertrophy and dilatation, is only to bring the gynæcologist's art into disrepute. At least, when we have failed with all forms of support to give relief, the less dangerous steps of colporrhaphy and abdominal fixation should first be tried, before we advise the removal of the uterus.

On the other hand, there must occur, and not infrequently, cases in which no support can be applied, nor can we hope for cure from any vaginal operation; and this means a life of misery to the patient whose daily bread may depend upon her ability to work. Morbid processes also may have occurred in the procident tumour, and the bladder be involved. Here, amputation of the cervix or hysterectomy is justifiable, and should be performed, the patient having been told the risks of the operation.

Case of Extreme Procidentia Uteri with Fibroma and Prolapse of the Bladder of Fifteen Years' Duration—Hysterectomy with Ablation of Portion of Vagina. (Plate XIV.)

Patient had been married sixteen years, and had six children. Uterus was first prolapsed fifteen years since, after the birth of her first child. It then yielded to treatment till the birth of the fourth child. She had been gradually becoming worse since, especially for the last few years, and had worn a support and belt, which did not give relief. Her occupation demanded continual standing. A large procidentia protruded between the thighs, and the uterus could be felt considerably enlarged. There was a deep erosion round the os uteri, with a suppurative discharge from the endometrium. The sound passed for about four inches downwards into the procident mass almost to a level with the external os. The catamenia were very frequent, dark in colour, and there was profuse bleeding.

PLATE XIV.

Case I.

FIBRO-
MATOUS
UTERUS
REMOVED
BY
VAGINAL
HYS-
TREC-
TOMY
FOR PRO-
LAPSE OF
15 YEARS'
STANDING.
SHOWING
ADHE-
SIONS.
RETURN
OF THE
BLADDER
INTO THE
PELVIC
CAVITY.
(AUTHOR.)



PLATE XV.

Case II.

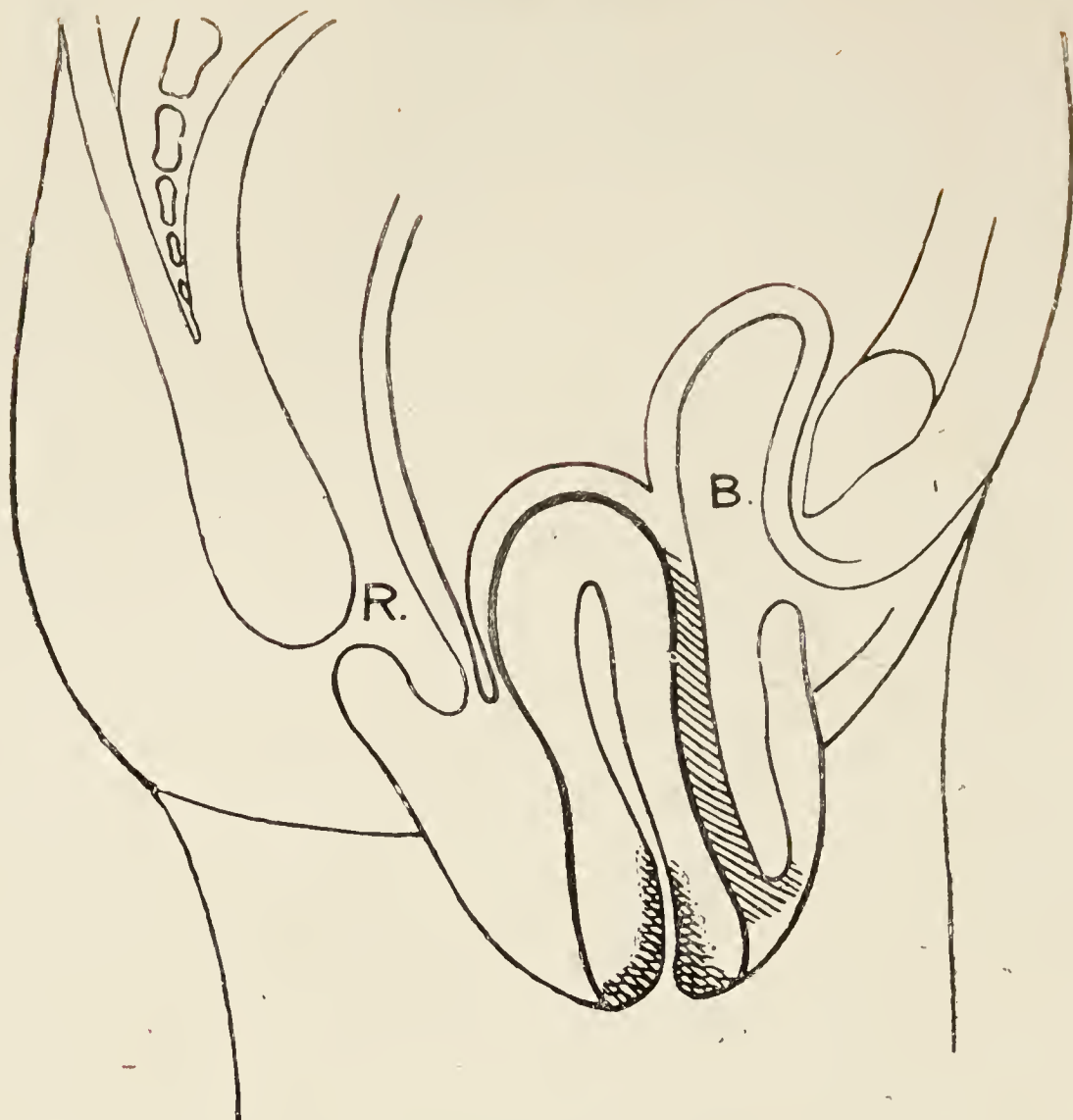
SENILE ATROPHIC
UTERUS REMOVED
FROM PROCIDENT
SAC AFTER THE
RETURN OF THE
BLADDER AND
RECTUM INTO THE
PELVIC CAVITY, IN
A PATIENT AGED 74.
(AUTHOR.)

Prolapse of twenty-
five years' duration.



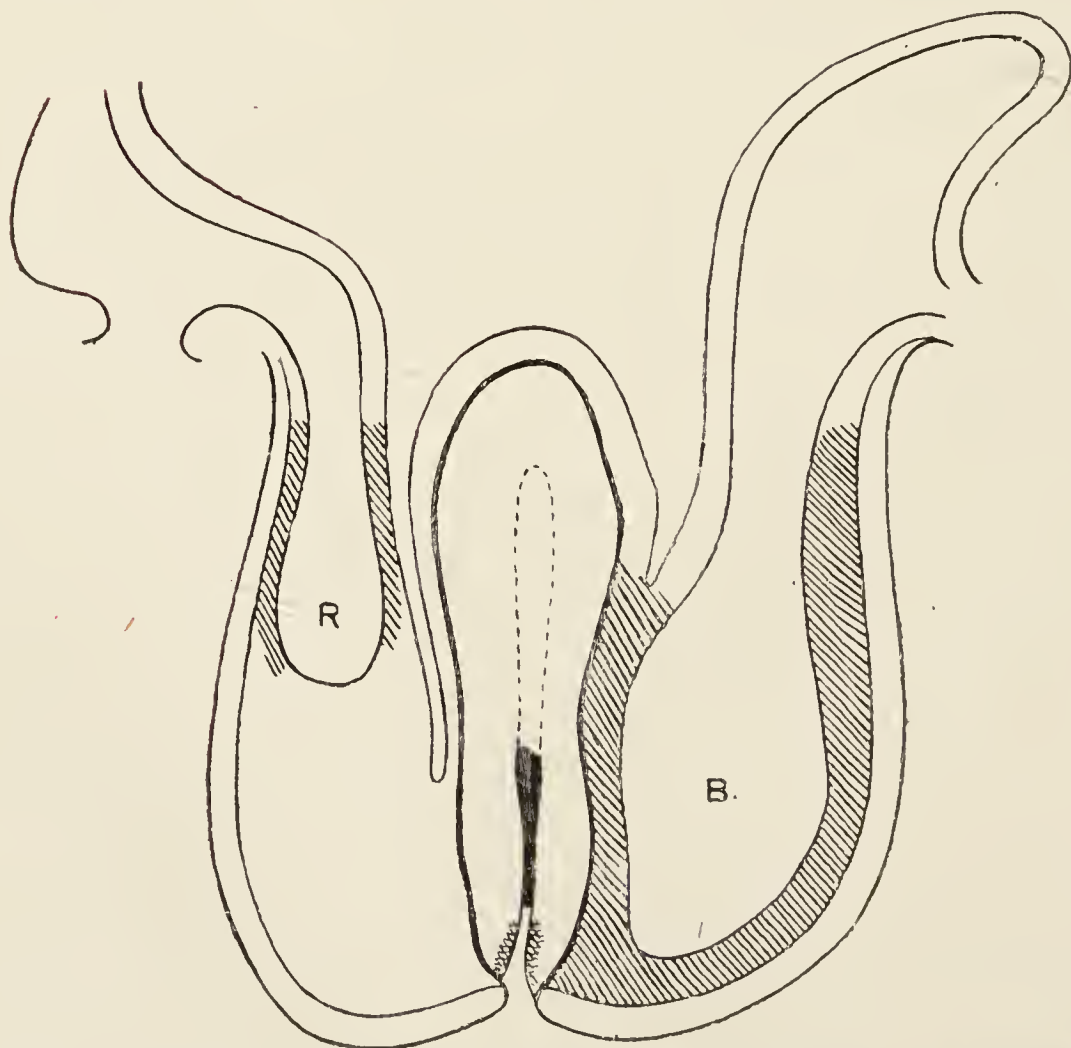
See reverse side for diagrammatic sections of Cases I. and II.

PLATE XVI.



CASE I. (p. 308).—SECTIONAL DRAWING, SHOWING EXTENT OF ADHESIONS TO THE BLADDER.

PLATE XVII.



CASE II. (p. 309).—SECTIONAL DRAWING, SHOWING EXTENT OF ADHESIONS OF THE SAC WALL, BLADDER, AND RECTUM.

[To face p. 309.]

The uterus was removed and a portion of the prolapsed vagina ablated.

The difficulty of the operation consisted in the freeing of the bladder from the uterus, to which it was adherent, as may be seen from the plate, for the greater part of its anterior surface. This was done by alternative working towards the uterus with the finger-nail, curved blunt-pointed scissors, and a small piece of sponge or gauze on a holder. There was an interstitial fibroid in the fundus of the uterus. The rectum was partly adherent behind. A flap of vagina was removed at either side. The peritoneum was laterally united with the vagina, a sterilized iodoform drain was passed into the peritoneal cavity, and the patient was treated as after an ordinary vaginal hysterectomy. The patient made an admirable recovery, being out of bed on the twenty-first day after the operation, and returning home on the twenty-sixth. She has been perfectly comfortable ever since, and there has been no tendency to the least return of the prolapse of the vagina.

Case of Extreme Procidentia Uteri of Twenty-five Years' Duration with Prolapse of Bladder and Bowel, and Adhesions both to the Sac Wall and the Uterus—Hysterectomy—Ablation of Portion of Vagina. (Plate XV.)

Mrs. S., aged 74, suffered from prolapse for twenty-five years. Of late she had been entirely confined to the house and unable to walk. In addition there was inability to control the bowel, and she had difficulty also in emptying the bladder. The tumour bore all the evidences usually present in old prolapse. The uterus could be felt atrophied and fiddle-shaped in the centre of the mass. The bladder reached close to the lower margin of the cervix. The cervical canal was closed a short distance from the os uteri; the latter was eroded, there was purulent discharge and ulceration in the surrounding edges of the cervix. The operation performed was the same as in the last case, only much more difficult. The bladder wall was practically one with the wall of the sac in front, and had to be slowly dissected off in the manner mentioned before. The ureters were exposed in doing this. The posterior surface of the bladder was adherent to the uterus, and this also had to be detached. The bladder was now free. The uterus was brought down, and the broad ligaments were ligatured at each side by three ligatures which included all vessels. In doing this the rectum was found partly adherent to the upper and posterior part of the uterus, and this was freed. The uterus was now removed, the bladder being returned into the pelvis and supported there by iodoform gauze. The rectum was pushed up from below, and dissected off from its attachment to the posterior wall of the sac; it was also returned into the pelvis, and supported. A semi-circular flap was now cut anteriorly and posteriorly from the vagina. The peritoneal edges were brought together with those of the vagina and the vault closed, and the vagina tamponed with iodoform gauze. The patient was out of bed in three weeks.

It is now several years since these patients were operated upon, and they are still in complete comfort.

A patient, aged 42, with prolapse of fourteen years' duration, was operated

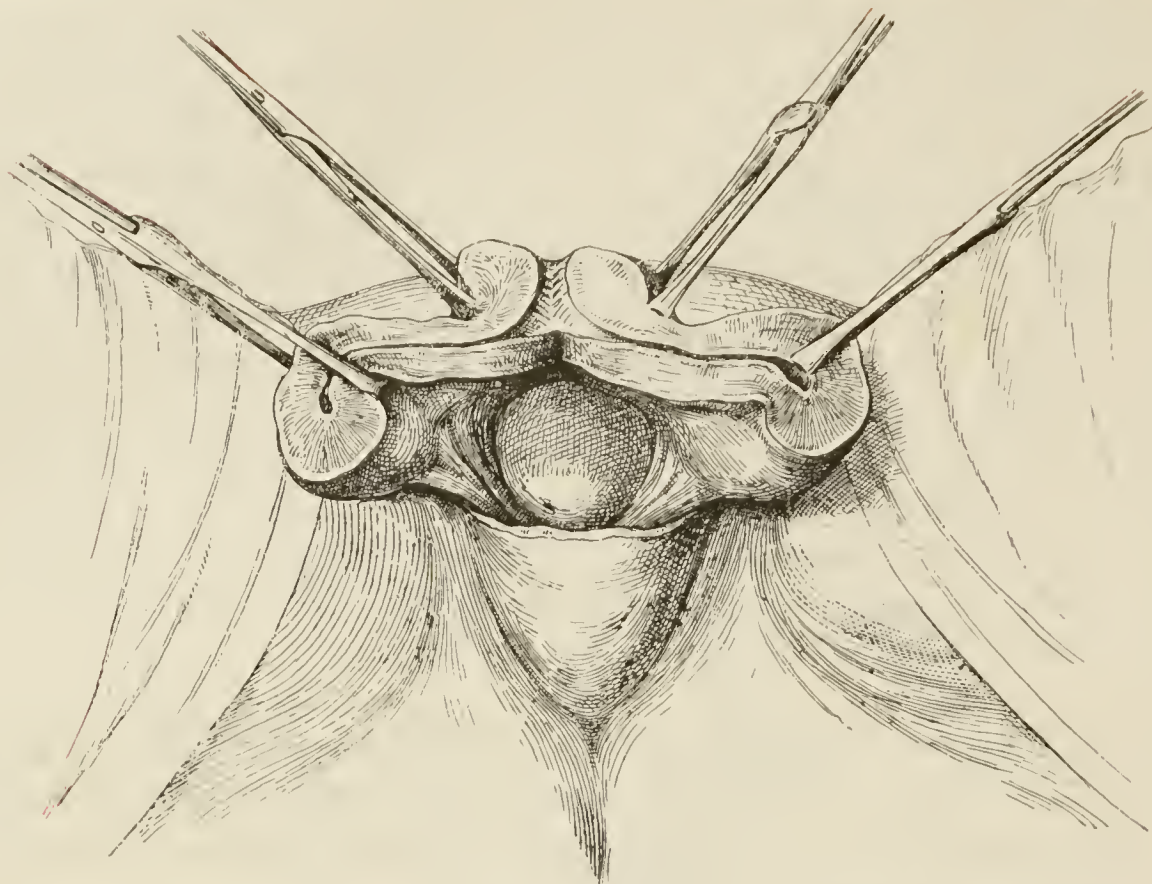


FIG. 225.—DISSECTION OF THE UTERUS IN TWO PARTS, FROM BEHIND FORWARD.
(DOYEN.)

The fundus having been drawn down through the pouch of Douglas.

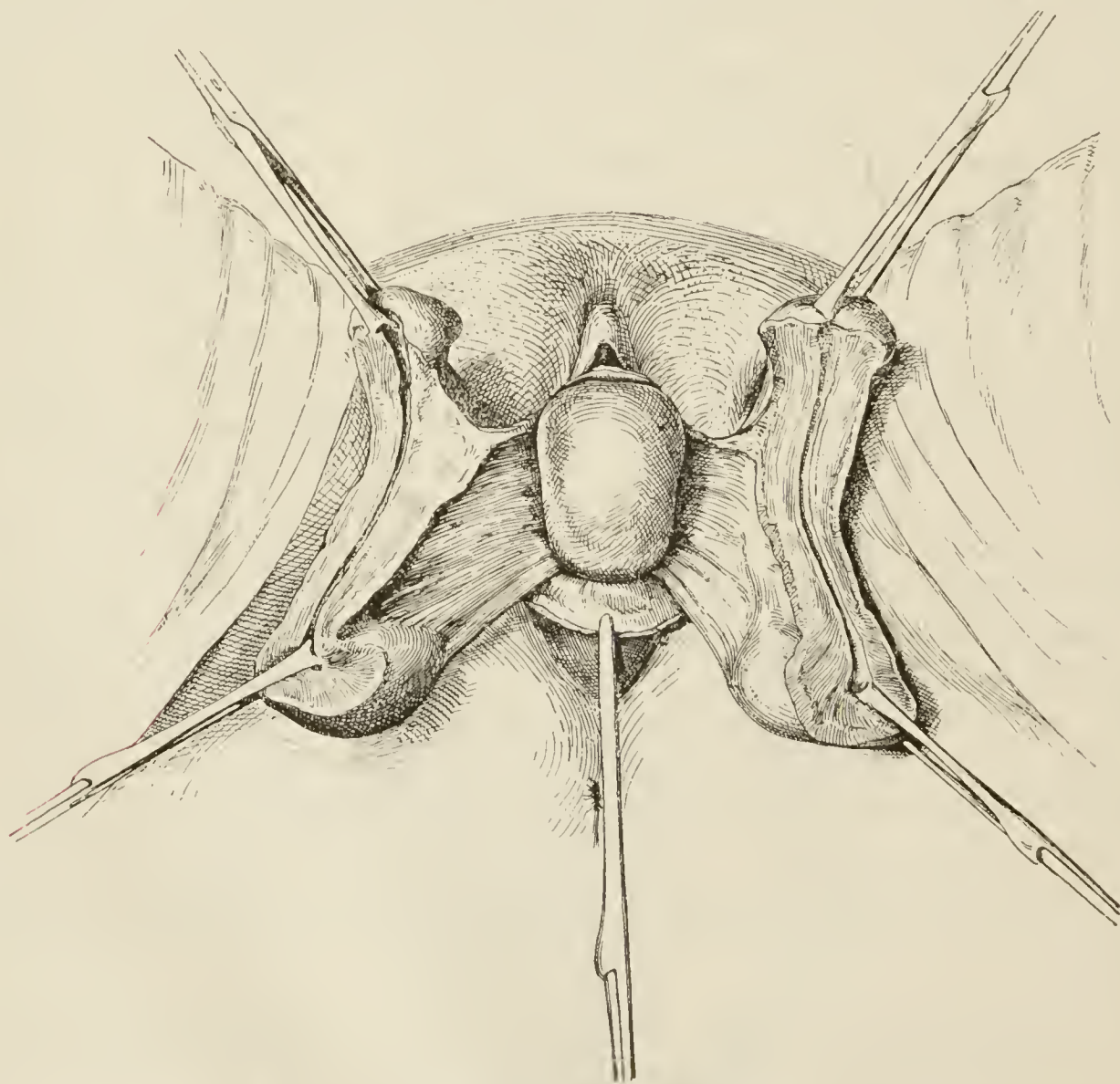


FIG. 226.—COMPLETE SEVERANCE OF THE UTERUS—THE NECK ABOVE—
PROTRUSION OF THE BLADDER. (DOYEN.)

upon by the author, and cured by fixation of the uterus. Here, however, the uterus was healthy.

Doyen's Operation of Panhysterectomy for Inveterate Prolapse.—Doyen remarks on the difficulties which have to be contended with in freeing the bladder in these cases and in ablating the uterus. The operation he performs he divides into five stages, or six if colpoperineorrhaphy be performed. He first opens the pouch of Douglas, and, drawing the neck of the uterus well up and in front, enlarges the opening and brings the fundus of the uterus down. He next divides the uterus by a posterior section as far as the fundus, continuing along the anterior wall until he arrives at the bladder, which he cautiously detaches. The uterus is thus brought in two halves into a state of retroversion. The mucous membrane of the anterior vaginal cul-de-sac is now divided, and any attachments of the neck are separated with the fingers. Should there be bleeding, it is arrested by forceps. The adnexa are now ligatured and the pedicle secured, the broad ligaments being first tied *en masse*, and then secured in two halves by transfixion. The bladder being replaced, either half of the uterus is convenient for traction on the broad ligaments, and for facilitating the peritoneal toilet and the section of the broad ligaments. We are then enabled to close the peritoneum completely after resection of the uterus, by bringing its anterior and posterior flaps together, while we fix the pedicles. He finishes the operation by the performance of an anterior colporrhaphy and a perineorrhaphy.

Ascent of Uterus.—The uterus recedes from the reach of the examining finger. It is well to bear in mind in practice that this recession of the uterus may be associated with (a) *pregnancy*; here we have (after the third month) the other local signs of pregnancy; (b) *ovarian tumours*—frequently in ovarian disease the uterus is not only drawn up from the pelvis, but the cervix is shortened, and the os uteri may be felt almost on a plane with the vaginal roof; (c) *fibrous and fibro-cystic disease of the uterus*; (d) *abdominal tumours* (springing from or connected with the abdominal viscera), as hydatid tumours, cystic growths, malignant disease; (e) *peritoneal effusion* (hæmorrhagic, serous, or purulent), pelvic and abdominal, with consequent adhesions; (f) *pelvic tumours*, occurring in connection with the rectum or vagina, or in Douglas' space. It is a matter of considerable importance in arriving at a diagnosis, when we discover a receding uterus, to determine carefully which of these conditions are operating in causing a recession of the organ.

Differentiation of Causes of Ascent.

The following table may assist in the differentiation of the conditions which may cause upward displacement of the uterus.

Early Pregnancy.—Uterine neck—shortened and softened. Os uteri soft, directed backwards—uterine fundus globular.

Ovarian Tumour.—Cervix uteri considerably shortened, but not softened as in the pregnant condition; os uteri unaltered; often hard and possibly of the sterile type; uterine canal normal in length.

Fibromyomata and Fibro-cystic Tumours.—Cervix frequently hard, giving the characteristic feel of fibrous development; often conical in shape; the mucous envelope movable over the interstitial tissue; uterine canal lengthened; continuity of tumour with uterus diagnosed bimanually and by the uterine sound.

Abdominal Tumours.—The entire uterus is frequently displaced, and pushed out of position to either side, or backwards towards the pouch of Douglas. The cervix is unaltered in size or consistence. The os uteri may or may not be of the normal character, so far as shape and size are concerned. The uterus in the majority of cases can be moved with the sound independently of the tumour. By bimanual examination it will be disassociated from the latter, while the uterine canal will be found of the normal length.

Peritoneal Effusions.—The uterus is frequently fixed, or moved with difficulty. The cervix in pelvic effusions is often soft and swollen, and sensitive to the touch. The os uteri is also soft, and if there have been endometritic inflammations it may be irregular in outline and surrounded by an erosion, while there is also a discharge from it. Bimanually, the uterus will be felt displaced to either side, if the effusion be lateral, and if surrounding the uterus there will be the 'board-like' feeling of the vaginal vault, and the accompanying difficulty of isolating the uterus from the peri-uterine hard effusion, which in some cases may be mistaken for a fibroid filling the pelvis. Here again the uterine cavity will not necessarily be enlarged, and there is not infrequently considerable displacement of the bladder. By the recto-vaginal examination the displaced adnexa may be felt, and the limits of the effusion, as well as its relation to the uterus, determined.

Pelvic Tumours.—In the instance of pelvic tumours, occurring either in the space of Douglas, the rectum, vagina, or bladder, the cervix uteri and os are normal in size and to the touch, but the cervix is displaced proportionately to the size, position, and direction of growth of the tumour, leaving it still movable and the uterus easily disassociated from it by the bimanual examination.

For further hints in the differentiation of pelvic tumours from conditions in which there may be ascent of the uterus, see chapter on 'First Steps in Examination,' and those on the diagnosis of the fibro-myomata and ovarian systema.

CHAPTER XIV.

UTERINE DISPLACEMENTS (continued).

Inversion of the Uterus.

By inversion of the uterus we simply mean a turning of the uterus inside out. It is partial or complete, acute or chronic. There are two stages of partial inversion (Crosse): (1) *depression*, (2) *introversion*. The fundus is received into the cavity of the uterus, ultimately reaching to the os uteri; the intruding fundus is grasped by the uterus, and the process of intussusception is continued until the extrusion of the fundus from the os uteri occurs. Once this has happened, the protrusion of the fundus and body of the uterus from the os uteri may continue until the cervix and lips of the os uteri itself are inverted.

Inversion may be met with either as a sudden occurrence or as a chronic condition. The former accident is more fully discussed in works on 'Midwifery.'

The essential element—as it always is the predisposing one—in inversion is an atonic state of the uterine parenchyma, favouring relaxation of the muscular fibres. This leads to partial prolapse of a portion of the uterine wall, and is associated with an irregular contraction of the surrounding muscular tissue. The prolapsed portion is treated by the uterus as a foreign body, like a piece of placenta, or the hand; it excites contractions which end in expulsion of a part or the whole of the fundus. This view (Rokitansky) is not inconsistent with the possible and occasional origin of the inversion at the cervix uteri (Taylor and Klebs), which latter is inverted and protrudes into the vagina.

Causes.—Atony of the uterus, in whole or part, is produced by (1) parturition, (2) tumours and polypi, (3) placental adhesions, (4) hæmorrhage. The process of traction of the uterine wall is associated with the first three of these; hæmorrhage is a consequence of each of the three. If there be general relaxation of the uterus, such

an exciting cause as any violent exertion, or severe coughing, might be sufficient to produce a slight inversion or depression, and give the first impetus to the morbid process. It would appear that inversion of the virgin uterus may take place (Puzos, Boyer, Baudelocque, Langenbeck). Goodell believes that ectropion of the cervical

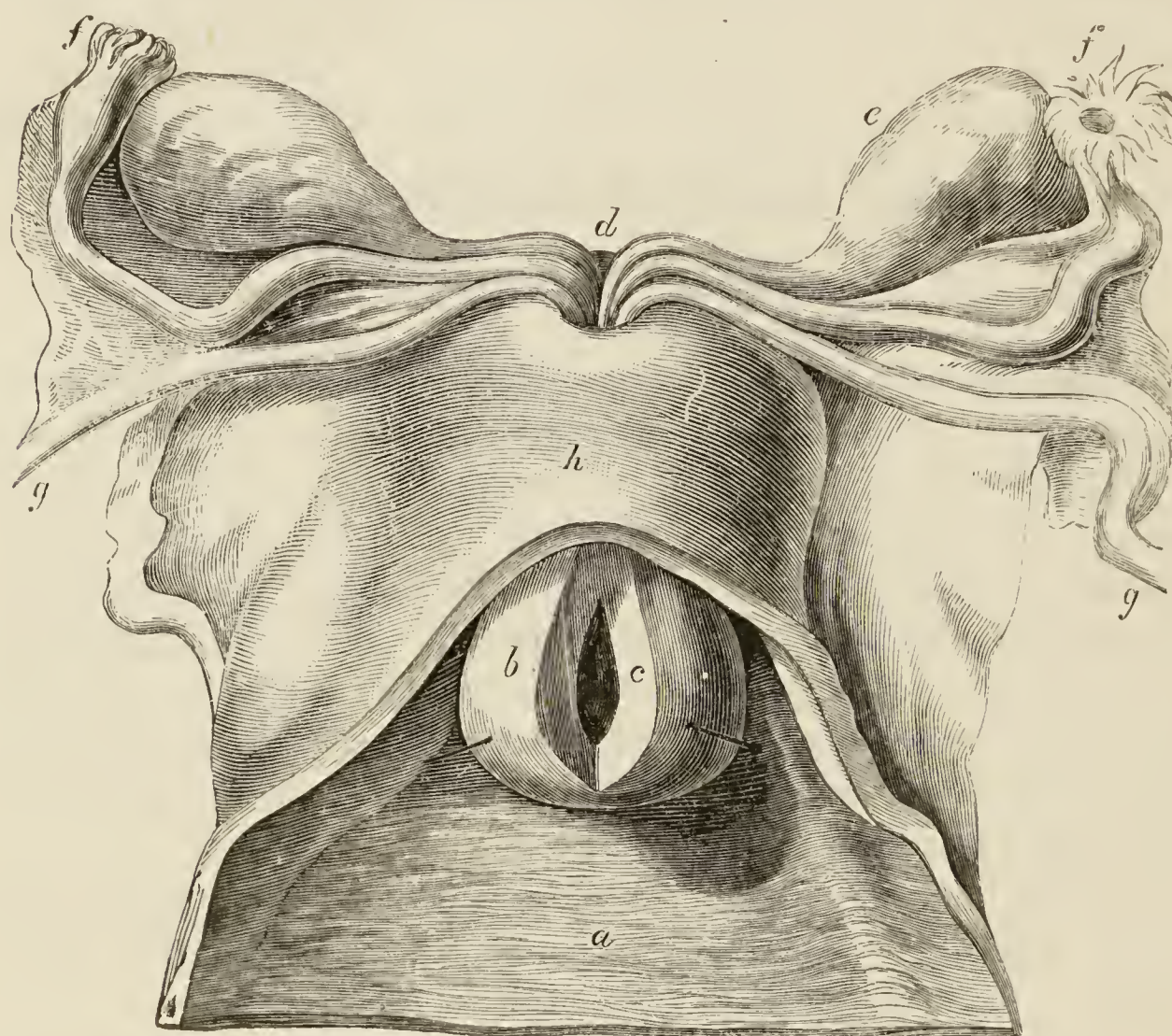


FIG. 227.—INVERSION OF THE UTERUS. (ROBERT BARNES.)

a, vagina; *b* and *c*, inverted uterus incised to show the cavity; *e*, *f*, *g*, ovaries, Fallopian tubes, and round ligaments; *h*, cervix covered by peritoneum. Two-thirds size, after Crosse, in Musée Dupuytren.

mucosa may occasionally follow the general relaxation consequent upon sterility, and masturbation in young girls, and thus start the inversion process.

Aveling thus classified inversion :

Automatic or Fundal.	}	Result of inherent muscular contraction. Placental tumour.
Systemic (generally Cervical).		
Mechanical (Propulsive) or Extractive).	}	Result of blows; manual compression; abdominal pressure from viscera, fluid, or gas; traction exercised on or by cord or tumour.

Signs and Symptoms.—These are: the presence of a tumour, generally not voluminous, felt in the vagina, simulating polypus, attended frequently with hæmorrhage, either constant or periodical; bearing-down pains; pain occasionally in walking; perhaps rectal and vesical distress. Anæmia is a common attendant, from the associated loss of blood and general debility.

Differential Diagnosis.—The main proofs we rely on that a tumour in the vagina is an inverted uterus are: (1) the

presence of a soft, readily bleeding and sensitive tumour; (2) the absence of the uterus from its position in the pelvis; (3) the absence



FIG. 228.—PARTIAL INVERSION OF UTERUS, SECOND DEGREE. (BONNET AND PETIT.)

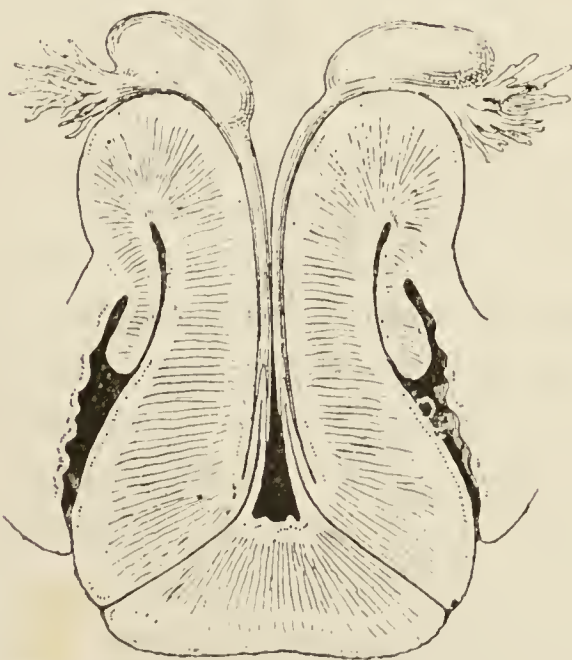


FIG. 229.—INVERTED UTERUS. (DOYEN.)

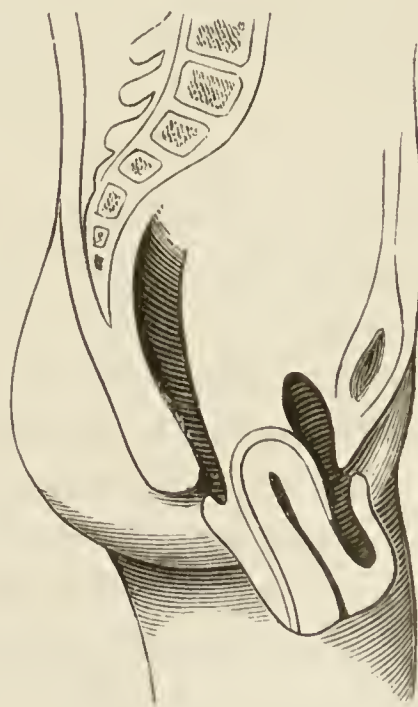


FIG. 230.—PROLAPSUS UTERUS. (SCHREDER.)

of the normal uterine opening, and the impossibility of passing the uterine sound farther than the neck: the finger feels the cervix at the summit of the tumour, perhaps thinned out to a ring.

In Complete Inversion.—A case of suspected inversion has to be differentiated from polypus or procidentia, and in the instance of partial inversion, intra-uterine fibroid. Having made a careful digital examination of the size and consistence of the tumour, we explore it through the rectum and detect the absence of the uterus. By conjoined examination we confirm this. We take the uterine sound, and find it arrested at the neck of the uterus, round which we sweep it: it may pass just inside the cervix for the extent of an inch or an inch and a half. The sound is now passed into the bladder, and the finger into the rectum, and by the recto-vesical examination the fact that the uterus is absent is ascertained.

In Partial Inversion.—This is much more difficult to diagnose. The trouble is to distinguish it from an intra-uterine fibroid. By

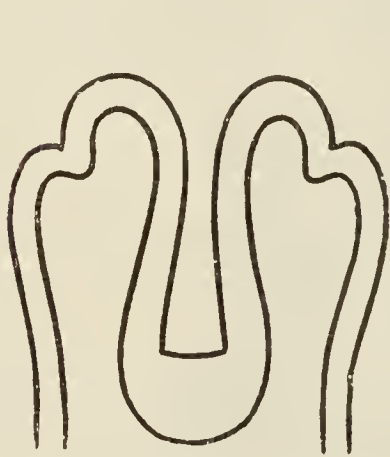


FIG. 231.—OUTLINE DIAGRAM OF COMPLETE INVERSION.

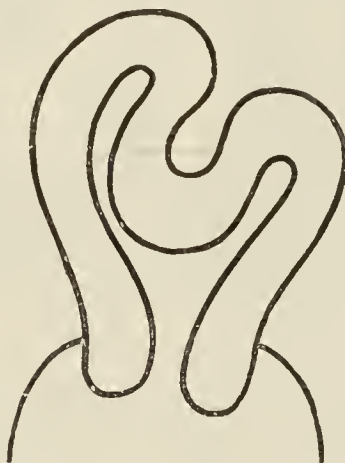


FIG. 232.—OUTLINE DIAGRAM OF PARTIAL INVERSION.

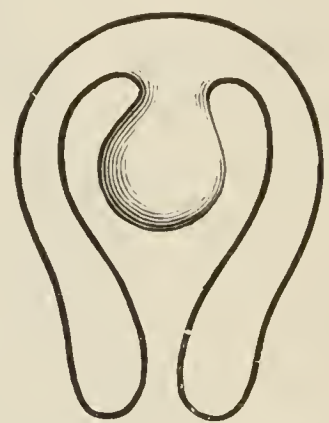


FIG. 233.—OUTLINE DIAGRAM OF POLYPUS AT SUMMIT OF UTERINE CAVITY.

the conjoined examination we may detect the absence of the fundus. On passing the sound, it is arrested by the prolapsed portion of the uterus, which is sensitive. In the fibroid growth the uterus is enlarged, and the sound passes farther than in the normal uterus, while the tumour is painless. The history of the two is different; the fibroid growth is slow—there is no relation to parturition. Inversion occurs, as a rule, suddenly, and the uterus is sensitive. When there is room for doubt, the cervix should be fully dilated and a digital exploration made.

Prognosis.—This must always be given with reserve. Even admitting, says Thomas, the undoubted authenticity of the cases reported, spontaneous reduction must be regarded only as a curiosity,

and not as a process to be anticipated. The patient may be worn out with pain and exhausted by hæmorrhage.

Treatment.—This may be briefly considered under three heads : (a) palliative ; (b) taxis and pressure ; (c) operative.

Palliative.—Palliative treatment is hardly to be considered in the face of modern advance in the treatment of inversion, and can only be justified in view of the refusal on the part of the patient to submit to interference of any kind. It consists of strong astringent preparations of alum, tannin, perchloride and persulphate of iron, matico, hamamelis ; daily injections of very hot water ; ergot given internally. Aran, in very bad cases where amputation was contra-indicated, used the Paquelin cautery, or potassa cum calce, to the surface of the mass. In this manner, when the uterine mucous membrane thickens and becomes like skin, the course of nature is imitated.

Taxis and Pressure.—This must in very old cases be assisted by the local application of cocaine, in the form of ointment and suppository. The vagina is previously dilated by hydrostatic bags, and possibly two or three small and superficial longitudinal incisions through the tissue of the cervical ring. But the great danger of the employment of force has to be remembered ; the vagina may be ruptured, or fatal peritonitis result. ‘A small hand,’ says Thomas, ‘a cautious, unexcitable mind, and constant vigilance, during all the efforts by taxis, must be combined with thorough knowledge of the subject.’ ‘I confess that I should prefer to trust a patient in whom I felt great interest rather to the operation of abdominal section (for the reduction of the tumour), than to that of prolonged taxis at the hands of a rough, unintelligent and inexperienced surgeon.’ If this be his deliberate opinion, after a personal experience of nine cases of inversion, it is not necessary to dwell on the care and caution with which attempts at reduction of the chronically inverted uterus must be made.

The ordinary practitioner is not likely to attempt this operation without mature consideration and careful consultation. The principal obstacle to be overcome is the constriction of the cervical ring, through which has to be returned the enlarged and hardened uterine body.

Aran, Marion Sims, Robert Barnes, and Matthews Duncan tried to overcome the difficulty by making multiple incisions into the cervix, and, more recently, Hirst successfully adopted this plan in a case of three months’ duration.

In practice it would be far better to trust to continuous pressure than run the risk of any dangerous force or prolonged manipulation. Before an attempt at reduction be made, the rectum and bladder should be emptied, and an anæsthetic administered. The nails of the operator's hands are carefully pared, and the operating hand is well oiled. One hand must be laid on



FIG. 234.—REDUCTION OF INVERTED UTERUS. (EMMET.)

the abdomen, over the situation of the ring of the opposing cervix. With this counter-pressure is maintained against the hand operating in the vagina. McClintock's axiom is to be remembered, of returning first the part which has inverted last. Emmet's plan is then adopted. The patient is placed in the lithotomy position; the inverted uterus is grasped between the finger and thumb of the right hand; the fingers of the left hand maintain steady counter-pressure on the abdomen. The inverted fundus is pushed steadily upwards with the right hand, while the fingers are used to dilate the cervix. If the case be comparatively recent, the plan of dimpling the fundus with the fingers, and forcing the indented wedge thus formed into the cervical ring, and so overcoming the resistance, may be tried. Repositors of different kinds have been used. If the cup-repositor of White be used, the cup is steadied with the right hand against the fundus, and the force is applied by means of a spiral spring, which the operator presses against the chest, counter-pressure being maintained by the left hand over the cervix on the abdomen.

Pressure.—If from the duration of the case, or from the experience of moderate manual efforts at reduction, we deem it inadvisable to proceed with the taxis, continuous elastic pressure may be tried. Aveling, Robert Barnes, and Braxton Hicks were prominent advocates for continuous pressure. The stem and cup of the former may be used for the purpose. The curved stem has at one extremity a cup-shaped disc of rubber, or a hollow cup of caoutchouc. The other end of the stem has four strong rubber bands, attached to the abdominal belts, which serve to maintain the pressure on the fundus. By tightening the back or front bands, the direction of the pressure is changed. Counter-pressure is secured by an abdominal pad placed under a broad flannel roller. The position of the cup and the direction of the stem are watched from day to day. It is well to pack the vagina carefully, round the inverted uterus, with a tampon of antiseptic wool. Robert Barnes advises periodical attempts at reduction with the hand, under chloroform, when the cup is removed. Should the continuous pressure give rise to pain, or should there be

any sloughing, it must be relaxed, and an interval of rest permitted. Its tolerance may be assisted by the administration of bromide of potassium and chloral. The application should be made between the menstrual periods. Should a tumour complicate, or be the cause of, an inversion, we must remove the growth, and then endeavour to rectify the inversion.

Noeggerath's method consists in the indentation of one corner first, assisted by counter-pressure over the ring of inversion from above the pubes.

As regards the time after the occurrence of the inversion at which successful reposition may be attempted, this varies; Aveling's opinion was that every case of chronic inversion of the uterus was curable.

Fancourt Barnes recorded a case of inversion of the uterus, of four months' standing, successfully restored in eight hours by means of Aveling's repositor.

Jaggard has recorded a case of twenty months' standing reduced, after thirty-three days, by colpeuryesis.

Aveling cured eleven cases of chronic inversion by his sigmoid repositor. Each case took on an average 40 hours for its cure—the longest time occupied being $54\frac{1}{2}$ hours, and the shortest 9 hours. The following are Aveling's instructions for its use :—

Directions for using Aveling's Sigmoid Repositor.

'Having diagnosed inversion, determine by touch the size of the fundus, and select a cup of proportionate size. It should be in diameter slightly less than that of the fundus. Next apply the belt round the waist, and then the braces over the shoulders, and fasten them by safety-pins to the belt. This should be done in such a way as to leave room to pass the tapes, to which the rings are attached, between the pin of the safety-pin and the belt. Now the cup of the repositor should be applied to the fundus uteri, and held firmly in position by an assistant while the rings are adjusted, two being taken in front and two behind. The ends of the tapes should next be passed between the safety-pins and the belt, parts of the tapes drawn through, and a knot made at the ends to prevent them slipping back. Tension may be lastly exerted by drawing the tapes up through the pins and fastening them at any point by tying a loop. This loop can be easily pulled out and retied, should more or less tension be required. Care must be taken to have the tension equally distributed; for if the front bands be tighter than the back, there arises the risk of the cup being slipped back off the fundus; and the opposite may occur if the posterior bands be tighter than the front. The indiarubber bands passing to the front should be carefully laid outside the labia and packed with cotton-wool. If the patient be restless or complain of pain, morphia may be administered. She should be carefully watched, and the urine drawn by catheter when necessary. It is difficult to lay down any rule for tightening and loosening the tapes. This will be determined by the practitioner, who must judge by the existing tension, and the tolerance of it by the patient. In my last case, re-inversion was accomplished without the tapes being touched after their first adjustment.'

'Reduction takes place by the cervical method. Pressing on the fundus causes counter vaginal traction on the cervix, making it unroll gradually until the inner os is reached, where a little delay is caused by its being less dilatable. When this point is passed, the body of the uterus soon opens, and admits the cup. The last step must occur rather suddenly, for all patients say they feel that something has "given way," and comparative comfort is the result.

'When the inversion has been reduced, the sooner the cup is withdrawn the better, for the cervix immediately begins to close round the metal stem,

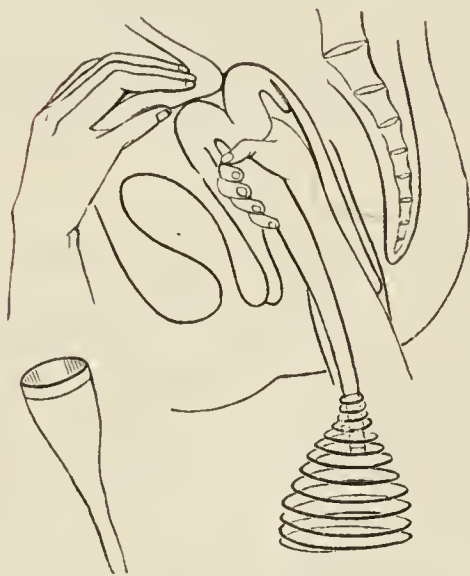


FIG. 235.—WHITE'S CUP REPOSITOR.
(THOMAS.)

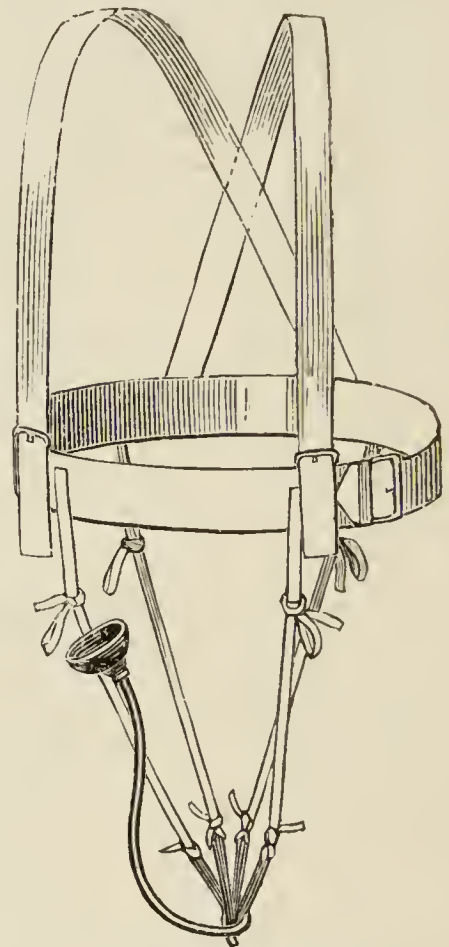


FIG. 236.—SIGMOID REPOSITOR.

and the cup becomes firmly grasped in the uterine cavity. The easiest way of removing the cup is to tilt it on end, and bring it through the os as you would a button through a button-hole. If it should have been long retained, an anæsthetic will assist. When the cup has been removed, pass a thick sound into the uterus, and, by pressing the point of it forward, the rounded fundus will be felt through the abdominal walls. Being satisfied that complete re-inversion has taken place, syringe out the uterine cavity with iodine water at 120° Fahr., which will cleanse its surface and make the whole organ contract.'

Elastic Ligature.—Perrier amputated the cervix by means of the elastic ligature, using a curved rubber forceps to draw the uterus well down. He surrounded the fundus with a ligature of strong silk, and over this an encircling ring of elastic rubber, both being tightened by means of a cog-handled holder. By this means the ligature, after the uterus was returned into the vagina, was slowly

tightened until it separated, from the ninth to the fourteenth day. The strictest asepsis was enjoined.

Kaltenbach, having secured the fundus by silk and elastic ligatures, amputated below these.

Vaginal Amputation of the Uterus.—The surface of the tumour and the vagina having been thoroughly cleansed, the uterus is drawn down, and the neck of the sac is brought well within reach. Two flaps are cut, beginning at the neck of the inverted uterus, anterior and posterior. Three or four strong gut or silk ligatures are then carried through the stump from before backwards before the peritoneum is opened in front. The peritoneal opening is enlarged, and the uterine vessels are secured at either side. The uterine ligatures serve to prevent the inversion of the stump. These are finally tied, and the flaps carefully approximated. The vagina is dressed in the usual manner, and the ligatures can be removed in from ten to twelve days.

Pan-Hysterectomy.—Vaginal pan-hysterectomy may be performed much in the usual manner, care being taken not to injure the bladder, which is not contained in the sac, as is frequently the case in prolapse.

Gaillard Thomas's Operation.—Gaillard Thomas first conceived and carried into successful execution the design of restoring the inverted fundus by opening the abdomen, dilating the contracting ring by a steel dilator, and applying pressure on the fundus from the vagina. By other operators (Haultain) the ring was incised.

Reuben Peterson, in a review of the entire subject,* states that he has traced out the result in fifteen cases in which Thomas' operation, or some modification of it, was performed. Of these, eight were successful, seven were complete failures, in one the result being fatal, and in four the uterus having to be amputated. Peterson also shows that to B. B. Brown is due the conception of the central idea of incising the posterior uterine wall in order to dilate the encircling ring by means of Sims' and Hank's dilators. Polk also advocated incision through the utero-vaginal junction in order to divide the constriction, advising the further free division of the cervix if necessary.

Küstner's Operation.—The following are the steps of this mode of reposition:—The pouch of Douglas is opened transversely. The finger is carried through the opening into the inverted uterine sac, and any adhesions are separated. A longitudinal incision is now

* *Amer. Gyn.*, June, 1903.

made through the posterior wall of the uterus in the middle line, from two centimetres below the inverted fundus to two centimetres above the external os, right down to the peritoneum. The uterus is next re-inverted by the aid of the index finger in the pouch of Douglas, which steadies the funnel, while thumb pressure is made on the fundus at the same time. The uterine incision is closed by two layers of sutures, the pouch of Douglas is also closed, and the operation is complete.

Dührssen's Operation.

Dührssen and Kehrer modified Küstner's operation by dividing the peritoneum *in front* of the uterus, between it and the bladder, the anterior wall being incised. Furneaux Jordan reduced an inverted uterus, which filled the vagina, by this operation, by means of which, he says, it is easier to effect reduction, as it is difficult to reach the pouch of Douglas in these extreme cases.* The operation is as follows:—

The uterus is pressed lightly backwards with the fingers of the left hand, and the vaginal mucous membrane is divided as in colpotomy. The bladder is hooked upwards and forwards by fine vulsellum forceps, and the peritoneum is opened in the usual manner. The index finger is directed to the opening of the cup formed by the inversion. Here is the source of difficulty in replacement. The os and cervix are now divided with scissors in the anterior median line, and the incision may have to be extended considerably along the anterior middle line of the uterus. The reduction is now effected, and the incision is closed with fine silk or gut. A small iodoform drain may be left in the utero-vesical pouch.

Piccoli's Operation.

In 1894 Piccoli formulated an operation, the steps of which are briefly as follows:—

Thorough asepsis having been secured, the uterus is lowered either by an elastic ligature or, as Duret proposes, a Museux' forceps. It is then curetted, and next a transverse incision is made in the cul-de-sac of Douglas, reaching, if necessary (as done by Morisani, who was the first to perform Piccoli's operation in 1896), as

* *Birmingham Medical Review*, Jan., 1897: 'Treatment of Inversion of the Uterus—a New Operation. Furneaux Jordan.'

far as the sacral ligaments. If reduction cannot now be effected, the entire thickness of the posterior wall of the uterus, from the external os to the fundus, is incised, and reduction is effected by doubling the uterus back upon itself from the incised wall. The mucosa is thus brought inside, and the peritoneal covering outside, while the incision appears in front instead of behind. The incision is then closed, and the uterus is replaced in the abdominal cavity by raising it through the opening in the pouch of Douglas, which is now sutured. If hæmorrhage be uncontrollable, hysterectomy must be performed.

Peterson's Operation.

Peterson's own operation, which was successful, consisted of the following steps :—

(1) Drawing down the inverted fundus with vulsella, while the anterior vaginal mucosa was rendered tense by being pulled upwards above the anterior lip of the inversion cup. (2) A transverse incision of two inches and a half close to the cervix through the vaginal mucosa, opening the utero-vesical pouch. (3) Exposure and division of the cervix by an incision carried upwards in the anterior median line to within one-third of an inch of the fundus. (4) Reduction of the inversion, with the adoption of John Taylor's suggestion of removal of a wedge-shaped portion of the bulging uterine wall so as to enable the retracted peritoneal edges to be brought together. (5) Closure of the uterine incision by a continuous catgut suture. Lastly, the passage of a catgut suture round the uterine end of each round ligament, the ends being passed through the anterior vaginal wall, and so tied that the line of incision was brought well up against the vesical peritoneum. Two small gauze drains were left, one between the bladder and uterus, and the other in the uterine cavity.

Peterson strongly advises the vaginal rather than the abdominal route in operating. He divides the methods under these heads :—

Partial posterior colpo-hysterotomy (Küstner's operation) ;

Complete posterior colpo-hysterotomy (Piccoli's operation) ;

Partial anterior colpo-hysterotomy (Kehrer's operation ; incision through the anterior uterine wall from the external os to the centre of the fundus) ;

Complete anterior colpo-hysterotomy ; incision through the anterior uterine wall from the external os to the fundus.

Of twenty-six cases by these different methods, there were three failures and no death. With regard to the difficulty of dilating the ring from the abdominal side, Peterson dwells on the unyielding nature of the connective tissue which is found in these cases in the uterine fundus, and also on the greater shock involved by cœliotomy. He quotes Spinelli's argument in favour of anterior colpotomy, that there is a greater likelihood of adhesions forming from the posterior incision, and *urges the advantages of John Taylor's suggestion of the removal of a wedge-shaped piece from either uterine wall, so as to bring the muscular and peritoneal layers into accurate apposition.*

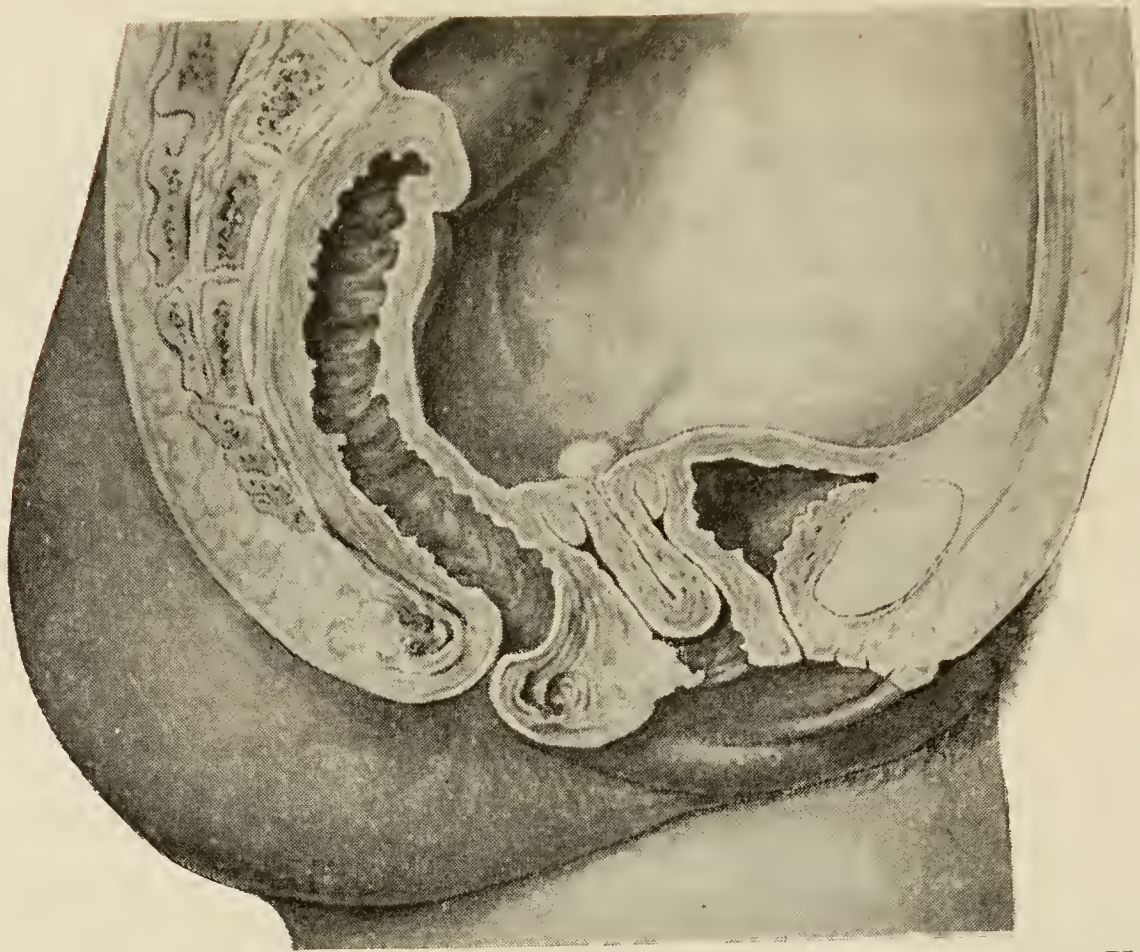


FIG. 237.—SHOWING SECTIONAL VIEW OF COMPLETE INVERSION OF THE UTERUS.
(HAULTAIN.)

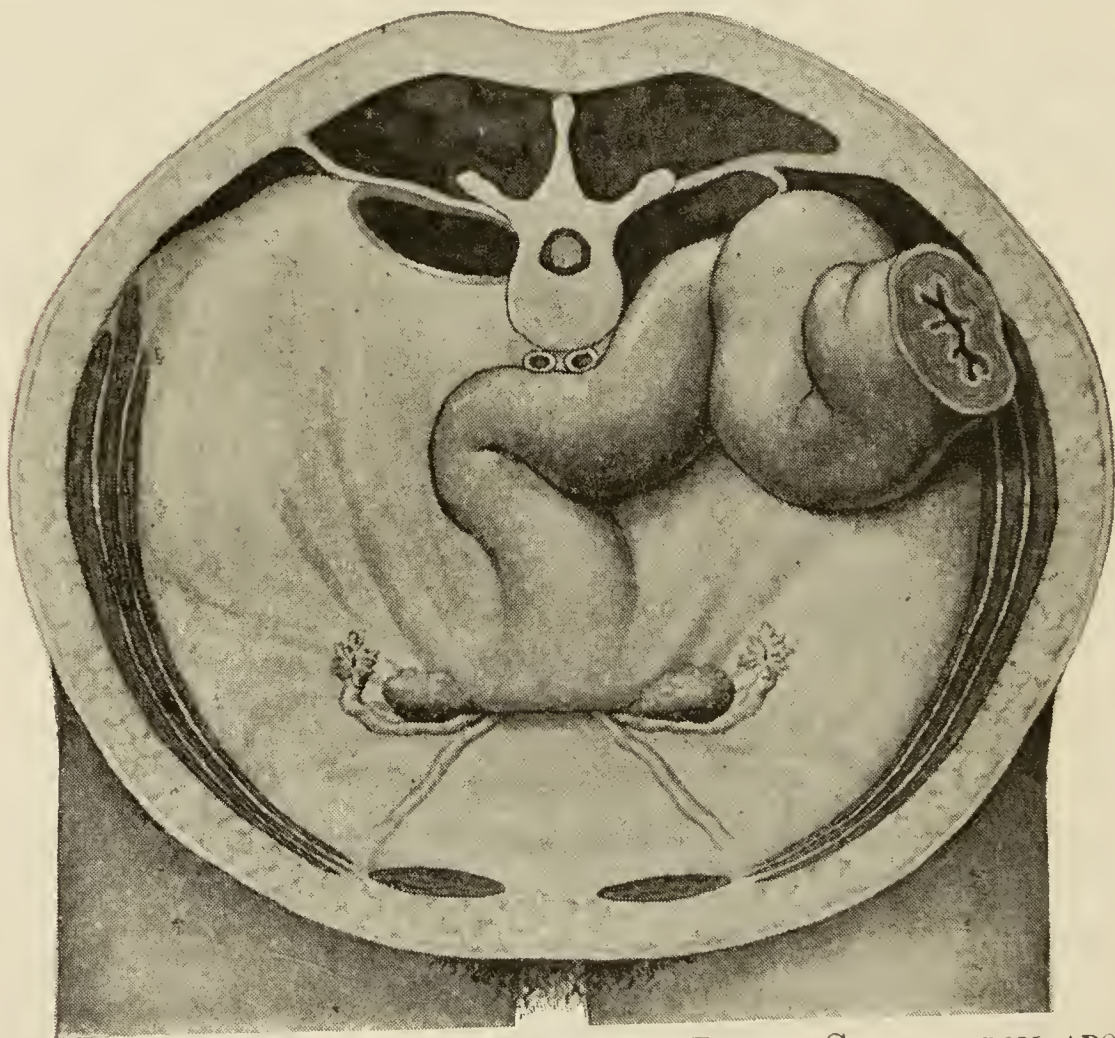


FIG. 237A.—VIEW OF SAME, SHOWING THE PELVIC CAVITY FROM ABOVE.
(HAULTAIN.)

These figures are representative of a case in which Haultain reduced the uterus by the abdominal route, after incision of the posterior uterine wall from within an inch and a half of the fundus to half an inch above the vagina, the incision being closed after reduction by catgut sutures, deep and superficial. Haultain argues that by the abdominal route the uterine incision is reduced to a minimum. We have the assistance of traction on the broad and round ligaments, and can more efficiently close the incision and control hæmorrhage. (*Brit. Med. Jour.*, Oct. 5, 1901.)

Reviewing all the evidence which has accumulated within recent years, and the results of the various operative procedures which have been devised for the reduction of the inverted fundus, we are irresistibly led to the conclusion that the older methods of pressure and taxis will be abandoned in favour of reposition by an operative procedure indicated in its extent and nature by the degree and duration of the inversion.

CHAPTER XV.

INFLAMMATION OF THE UTERINE TISSUES— ACUTE AND CHRONIC.

HYPERÆMIA (active and passive).

Acute—Metritis and Endometritis (cervical and corporeal).

Gonorrhœa.

Chronic—(a) Endometritis (cervical and corporeal).

(b) Chronic Hyperplasia (syn. Chronic Parenchymatous Metritis).

(c) Subinvolution.

(d) Catarrhal Inflammation of Cervix.

(e) Granular Degeneration of Cervix.

This is a simple clinical classification, and appears to be the best for clinical purposes. The pathological sources of metritis have to be remembered, and these are mentioned incidentally in treating of the causation of the various acute and chronic forms of inflammation of the cervical and corporeal canal. We find such primary causes of metritis in—

(1) *Puerperal septic processes*, initiated by pathogenic organisms (pyogenes and saprophytes); chronic mucopurulent discharges associated with similar germs (streptococcus and staphylococcus); traumatic inflammatory processes which follow on wounds of the cervix, lacerations, etc.

(2) *Gonorrhœal inflammation*, caused by the contact of gonorrhœal virus (*gonococcus—merismopedia gonorrhœa*).

(3) *Tubercular inflammation*, tubercle bacillus with or without evidences of tubercle elsewhere in the body.

(4) *Syphilis and syphilitic new growths*; secondary deposits; degeneration in the parenchyma or mucous membrane.

Hyperæmia.—The vascular system of the uterus is subject to considerable fluctuations in its blood-supply. This we should expect, not alone from its anatomical peculiarities in the distribution

of the uterine vessels and the erectile muscular tissue which surrounds them, but also from the influences to which the uterus is subject periodically, such as menstruation, coitus, ovarian excitement, morbid growths, displacements, peri-uterine inflammations. Nor can we ignore, in the uterus as elsewhere, the influence exerted on the arteries by reflex excitations. Hardly otherwise can we account for inflammatory mischief arising from some slight exposure to cold, or, in some instances, from the careful passage of the uterine sound and the uterine disturbance that follows mental shock.

Symptoms and Physical Signs.—Such sensitiveness and tenderness are present in these cases as we might anticipate would be from a slightly swollen and turgid womb. There often is an exaggeration of the natural secretion, and a tendency to menorrhagia, or some occasional irregularity of the periods, and metrorrhagia. On examination we may detect a congenital defect, predisposing to stenosis and dysmenorrhœa, or a uterine displacement, or small fibroid. The patient complains of pain in the back, and about the pelvis, and inability to walk much or to stand. Very often the sufferers are women who have to stand a great deal, or are occupied in some sedentary work. They may be dyspeptic, and coincidentally we may discover cardiac or renal mischief, or functional cardiac murmurs, and find the urine of low specific gravity.

Treatment.—Under this head I include general hygienic measures; such rest as can be obtained; avoidance of coitus; change of air; the warm vaginal douche; local depletion; the use of Kreuznach and Kissingen waters; those of Woodhall Spa in Lincolnshire, and Salsomaggiore; the bromides of potassium and ammonia; the combination, already recommended, of ergotine, quinine, and lupuline; the glycerine, or ichthyol (5 per cent.) and glycerine, tampon, worn at night, and the extract of *hydrastis canadensis*, both given internally and applied as a tampon. Alkaline and iodized baths are of service, taken with a bath speculum. The bowels should be regulated by aperients, saline waters, and occasional enemata.

Passive Hyperæmia.—If we do not see the case in the earlier stage of hyperæmia, there is very often a protracted history, and the general health has been for some time affected. The causes enumerated in bringing about active hyperæmia continue in operation. It is this condition of uterus which, when persistent, leads to general hypertrophy of the uterine tissues, and even to chronic hyperplasia. The same indications for treatment exist as in the active state. We must endeavour to correct any general

or constitutional fault, while we control local congestion and subdue irritation.

Acute Metritis and Endometritis.—For clinical purposes we may define this state as that of acute inflammation of the uterine parenchyma and the mucous membrane of the uterine canal. While we cannot separate pathologically the inflammation which attacks the muscular tissue of the uterus and its peritoneal covering from that which involves its mucous membrane, both being generally associated and intercurrent, still, this division into acute and chronic metritis and endometritis is an old practical distinction, which for clinical purposes it is as well to preserve. Most frequently the inflammation commences in the endometrium, and spreads to the muscular structure and cellular elements. On the other hand, the attack may begin in the peri-uterine cellular tissue, or the abdominal or uterine peritoneum. In such a manual as this it is better to take these associated conditions together, and discuss them at the same time.

Causation.—This will be traced to wounds; injury; any shocks transmitted to the uterus; operations; cold caught during a menstrual period; gonorrhœal infection; septic infection; puerperal sepsis; intra-uterine medication; the use of stem-pessaries or the uterine sound; vaginitis.

Symptoms and Physical Signs.—Rigors; high temperature; pain and tenderness in the hypogastric region; sense of fulness in the vagina, accompanied by heat and sensitiveness; absence of the vaginal secretion; viscid discharge from the uterus, changing to purulent—this discharge is at times acrid and irritating to the skin of the vulva. On digital examination the uterus is found enlarged and very sensitive; the lips of the os uteri have a tendency to gape. With the speculum the cervix and os uteri appear swollen and œdematous; the latter may be blocked with discharge, which varies in its nature according to the cause of the metritis.

Septic metritis—in its marked preliminary pyrexial symptoms, the great pain, the accompanying peritoneal mischief, and the history of a definite cause, as a recent operation, injury, or septic contagion—is not likely, with the exercise of care, to be confounded with any other affection. The approach of pelvic or general peritonitis is marked by varying degrees of immobility of the uterus, abdominal tenderness, and tympanites. I do not believe in any such affection as *uncomplicated* metritis. I have never seen

a case of metritis run its course without some degree of pelvic peritonitis, perimetritis, salpingitis, or endometritis accompanying it.

Diagnosis.—If with the foregoing symptoms we find, by digital examination and the bimanual method, that the uterus is enlarged and sensitive, while the vagina is hot or swollen, we can have no doubt of the nature of the affection.

Prognosis.—This must always be cautiously expressed; much will depend on the exciting cause of the inflammation and the stage at which we see it. Should the inflammation end in abscess, peritonitis, or septicæmia, the issue may prove rapidly fatal. On the other hand, if the inflammation remain localized, and yield to active treatment, it may terminate in a few days, or it may pass into a chronic form, leaving the patient with an enlarged (parenchymatous) uterus and chronic endometritis. It is well-nigh impossible to diagnose a metritic abscess. It is necessary to insist on the danger of using the uterine sound in any case of acute inflammation of the uterus or its peritoneal connections.

Treatment.—In acute septic metritis warm compresses should be used, and spongiopiline, sprinkled with laudanum and belladonna, applied over the uterus; leeches may be applied (eight to twelve) over the hypogastric region, close to the pubes. A thin linseed poultice, covered with oiled silk, or a mild turpentine and laudanum application, is laid over the lower part of the abdomen, if there be tympanites. A lanolated cream of oleate of mercury and morphia (5 per cent.) with extract of belladonna, spread on a piece of linen, and laid on the abdomen, under the moist compress or spongiopiline, will be found of use. A Leiter's temperature-regulator may be placed over the pubes (Fig. 238). Aveling's coil of the same tubing, which fits into a cup and stem, and can be worn in the vagina, is an ingenious application of Leiter's plan. The most efficacious of all means of cutting short the inflammatory process is the application of an ice poultice or ice-bag over the hypogastrium. The medicines we rely on are opium, half-grain to one-grain doses every third or fourth hour; quinine, either alone or combined with the opium; phenacetin or antipyrin can be tried as

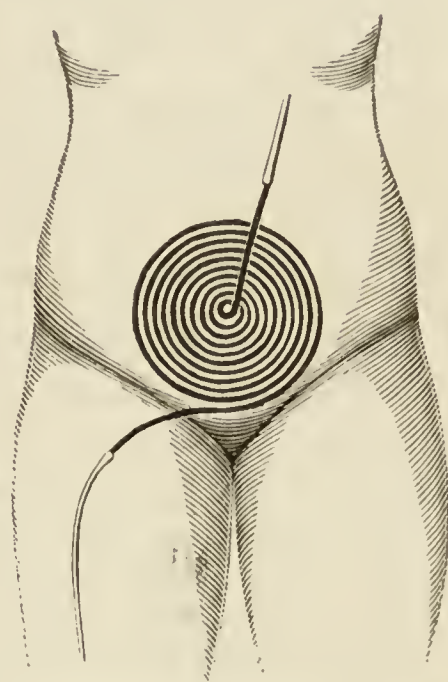


FIG. 238. — LEITER'S TEMPERATURE COIL.

anti-pyretics. The patient must be fed on liquid nourishment, such as milk, chicken-broth, and beef-tea. Alcohol should be administered according to the patient's strength, and its effects on the pulse and tongue watched. In the mean time, the vagina is douched out occasionally with perchloride of mercury solution (1 in 5000), or formalin (1 in 2000).

Curettage.—Curettage and drainage are specially indicated in some forms of metritis. By these steps the uterine isthmus is enlarged and freed from obstruction, the flow between the Fallopian tube and uterus is increased, muscular contractility in the tube and uterus is excited, congestion of the pelvic organs is lessened, and local sterilization of the uterine cavity by antiseptics is permitted. The decision, however, to curette the uterus will depend in great part on the nature of the inflammation.

If the metritis be due to intra-uterine causes, such as fungous endometritis, chronic purulent endometritis, retained products of conception, intra-uterine growths, or remains of operative interferences, it is my practice to curette in the manner already described, and I have never had any cause to regret my decision.*

The arrest of septic dissemination and absorption are thus secured, while the safety of future operative procedures on the adnexa is increased. 'A primary cœliotomy when curettage is indicated in a case of acute salpingitis and peritonitis,' says the writer in Baldy's 'System of Gynæcology,' 'stamps a man as blind to reason and to the work of other men, and as willing to open a fellow-being's abdomen rashly and unnecessarily.'

The practice of the gynæcology of to-day, in all cases of septic peritonitis, puerperal and other, is to discountenance the old methods of inaction, and to encourage the plan of timely local treatment of the source of the infection, in the endometrium, by curettage.

In all cases of acute uterine inflammation, the administration of a saline in the early stages is of service. *Liquor ammoniæ acetatis*, with sweet spirits of nitre; bicarbonate and citrate of potash; the saline mixture of sulphate of magnesia in infusion of roses, are perhaps the simplest and most useful. If the bowel be costive and the tongue coated, a few grains of calomel at night, followed by a saline aperient in the morning, will benefit.

If the metritis should supervene on operative treatment, or be the result of septic infection or gonorrhœa, the cervix should be dilated (if this has not already been done), the dull curette used, and the uterine cavity gently washed out with an antiseptic.

Chronic Metritis.—We must distinguish between the condition known as

* See the operation of Curettage and its dangers.

'chronic metritis' and the acute metritis which we have just considered. This state is rarely, as that term would lead us to suppose, the consequence of any acute inflammatory change in the interstitial tissues. It is very rarely an *arrested* resolution, as in other inflammatory processes of a chronic character. This remark applies more especially to that form of chronic metritis in which the parenchyma of the uterus is the part principally affected. When the acute inflammation of the mucous membrane has subsided, we find that a chronic state of congestion occasionally remains, which becomes aggravated in time. The metritic changes that accompany this chronic catarrhal discharge from the endometrium have risen independently of any acute inflammatory process in the parenchyma. It is this hyperplastic change that we have to consider in chronic metritis. At the same time, we cannot, as Schröder insists, separate from chronic metritis the idea of congestion, swelling, and pain; and consequently the clinical value of the term remains unchanged.

Chronic Endometritis.

The division of endometritis into cervical and corporeal is of considerable clinical importance, and the old term of 'endocervicitis' still retains its clinical significance.

Cervical Pathology.—There is inflammation of the cervical mucous membrane and the glands of Naboth, with hypersecretion of cervical mucus, alkaline in character, and enlargement and elevation of the papillæ. These have the appearance of granulations, so that the cervix assumes a granular appearance. These granulations bleed readily. Such abrasion of the epithelium is in error occasionally spoken of as 'ulceration.' It is perhaps the most frequently met with of all uterine inflammations.

In that form of cervical endometritis characterized by a profuse secretion, the villousities of the mucous rugæ are exaggerated, and sometimes glandular cysts form projections on the surface of considerable size (Bonnet and Petit). The more superficial epithelial cells are elongated, or in a state of transformation. The glands are more numerous and scattered, or are in part obliterated by the formation of cysts. Much more frequently than in corporeal endometritis they are found in the muscular wall in a flattened condition. There is proliferation of the gland-cells, their nuclei being displaced, the cells altered in shape, much elongated, or, on the contrary, flattened and shrivelled, according as the mucous contents are retained or not. Around the glands and the vessels there is an increase of the normal cells, and an infiltration of round cells. The hyperplasia of the glands may give rise to hypertrophy of the neck, without any involvement of the stroma. Under the head of external cervicitis are included those inflammatory lesions which are seen on

the external surface, and which are in pathological and anatomical continuity with internal cervicitis, not with vaginitis. The intra-cervical muco-purulent flow is frequently found on the external surface of the os, or inside or between the lips, the moist patches, of a vivid red, being accurately marked off from the remainder of the vaginal portion. Occasionally these red patches, by their undulating folds, recall the appearance of the intracervical mucous membrane. They are the catarrhal surfaces of Hart and Barbour. At times they have an eroded look. Their surfaces may be either smooth, granular, papillary, or villous. With regard to the question of a true ulceration occurring in the neighbourhood of the lips of the os, Fischel, Doederlein, and others, ascertained that there is a loss of substance which exposes the cellular tissue. These true ulcerations, however, are very few in number, and are mingled with pseudo-ulcerative spots, which, as well as the ordinary papillæ, are covered by cylindrical epithelium. They may be thickened, or possibly effaced, by glands—cystic or otherwise—which are analogous to the intracervical glands, and (Cornil) may be of a true sebaceous character. But it is a question whether this partial pseudo-ulceration is not to be regarded as an erosion, an ectropion of the cervical lips, or a congenital anomaly (Bonnet and Petit). The fact that glandular cul-de-sacs have been found beneath the pseudo-ulceration, at a distance from the os, and under the stratified pavement-lining which surrounds it, is advanced against the theory that the erosion is limited to the superficial layers of the epithelial pavement (Ruge and Veit, Fischel, Landau, Abel, Cornil).

The oblique direction in which the glands are found has been advanced as an argument on the other side. Ruge and Veit think that these are glandular neo-formations; but Cushing, Bonnet, and Petit question if they have not mistaken the appearance of incipient epithelioma for them.

The papillary or granular condition is found equally in the pavement epithelium and the cylindrical, which pass insensibly the one into the other in this situation, and give to it that papillary appearance which is so characteristic. Bonnet and Petit view the theory of ectropion of the endocervical mucous membrane, complicated by inflammation, as fitting in with most of the pathological facts. The ectropion is accompanied by more or less eversion of the subjacent muscular wall. The general physical appearances of such eversion are readily recognized.

Fischel made an examination of the uterus of twenty-eight infants, and found that in ten cases the vaginal surface around the external orifice was covered to a certain extent with cylindrical epithelium, and not with the pavement form, the usual situation of the line of junction between the two

being thus lost. This constitutes what has been called a *congenital physiological ectropion*.

The cylindrical cells may be interspersed between islets of flat cells, or arranged in clusters analogous to those of the intracervical glands.

Bonnet and Petit conclude 'that from the histological point of view the pseudo-ulceration may be simply an ectropion of the intra-cervical mucous membrane, attended by superficial inflammation, associated possibly at the time with epithelial and dermal complications and eversion of the cervical lips. It may be an erosion of the pavement lining of the vaginal surface of the uterine neck, which can be increased by the presence of abnormal glands of congenital origin.' A congenital anomaly through a defect in the transformation of Müller's epithelium 'is another cause of this condition.' They think that true ulceration is always of a partial character, occurring over the false form, and is of the same nature as a follicular erosion, which results from the bursting of Naboth's follicles.

Diagnosis will depend more or less upon the presence of the enlarged follicles, and the character of the epithelium which covers the abraded part, whether the ectropion or eversion be of a traumatic, inflammatory, or congenital origin. The obliteration of the papillæ through swelling of the mucous membrane accounts for the smooth appearance of the pseudo-ulcerations. The papillary, granular, or villous aspect may be due to an incomplete abrasion, or at certain points to a more extensive destruction of the papillæ on the vaginal surface.

Some Special Forms of Endometritis.—Hypertrophic Endometritis.—With reference to corporeal endometritis, Bonnet and Petit consider that *hypertrophic endometritis* has in its nature two factors, the one of an inflammatory, the other of a trophic origin. They divide corporeal endometritis into two forms; (1) that with hypertrophy of the mucous membrane, (2) that with atrophy of the same. In the former there is a considerable increase of the endometrium, at the same time that it loses its normal firmness and is more easily detached, while its surface is broken up into elevations and depressions, due to alterations in its glandular structure, or possibly to true vegetations which in the course of time become polypi. The glandular degenerations or hyperplastic changes are more manifest and persistent in some cases, with the tendency to a natural transformation into the epitheliomatous type.

These glandular changes are in part due to a hypertrophy or hyperplasia, which has its origin in the cylindrical epithelial lining, part retaining, and part losing, its vibratile cilia (Cornil), the gland-tubes being choked with mucous and migratile cells. Hyaline changes, analogous to those seen in albuminuria, have been noticed by Cornil. In the connective tissue there is swelling of the cells and dilatation of the vessels.

Atrophic Corporeal Endometritis includes those lesions which result from interstitial proliferation or the microbial action on the normally degenerated tissues. The interglandular stroma is sclerosed; the corporeal glands are

atrophied; the lining epithelium is transformed or disappears; ulcerations occur discharging pus or blood.

Hyperplastic Endometritis.—Here proliferation and hypertrophy of the

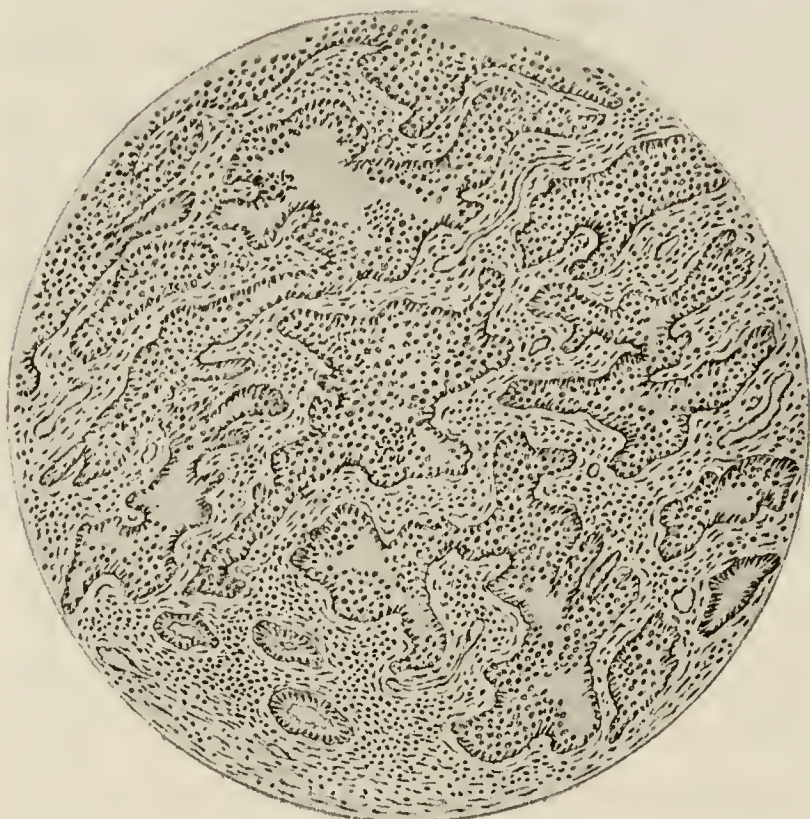


FIG. 239.—ADENO-CARCINOMA OF CERVIX UTERI.
($\times 100$.)

connective tissue are the principal features, the cells not only swelling and proliferating, but assuming the aspect of true decidual cells, fusiform or giant. Sinéty has described a form of interstitial endometritis in which he discovered embryonic vegetations.

Hæmorrhagic Endometritis is characterized by the number of small vessels seen on the surface of the mucous membrane. That condition to which we have already referred, in which polypi, whether glandular, muco-fibroid, or vascular, are found, has been denomi-

nated 'polypoid.' In these cases, there is a considerable increase in the interstitial tissue.

Shaw-Mackenzie emphasizes the difficulties of diagnosis in cases of hæmorrhagic endometritis, and the

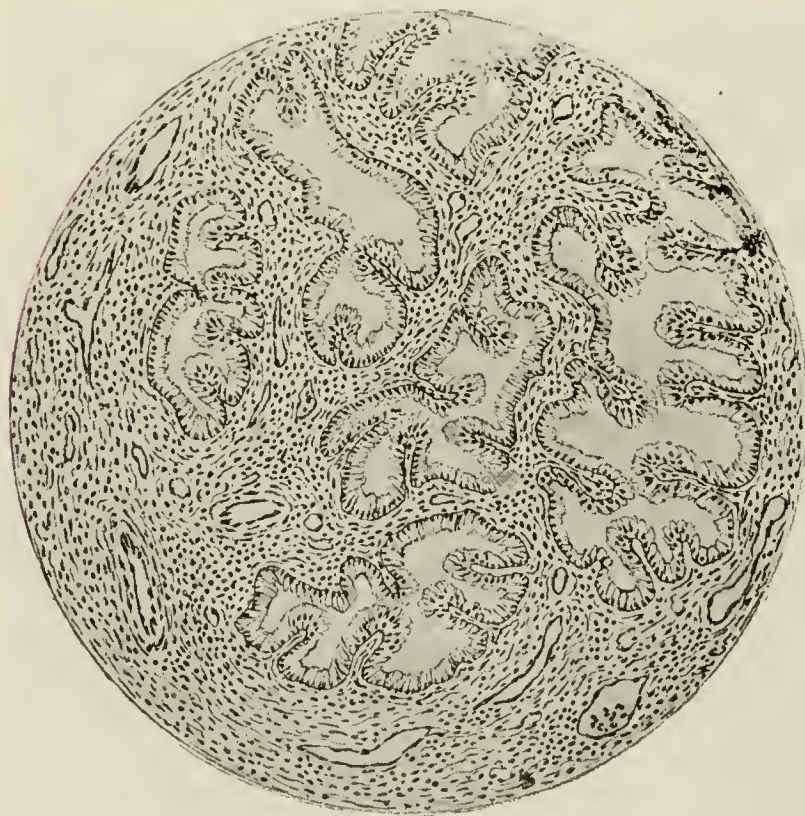
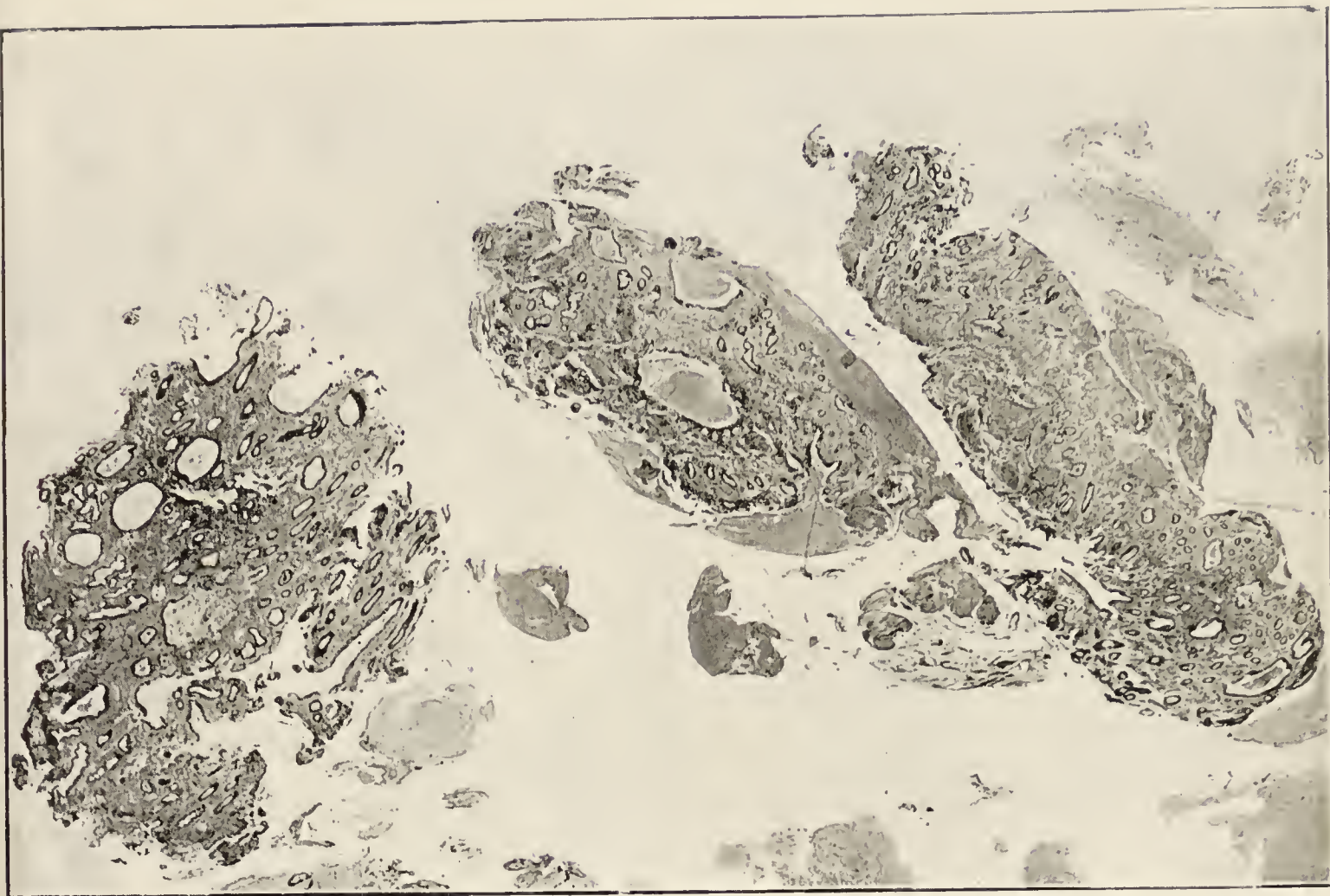


FIG. 240.—PAPILLARY EROSION OF THE CERVIX.
(TARGETT.)

differentiation between it and malignant disease as sarcoma and adeno-sarcoma. In some cases enlargement and irregularity of the uterine glands, with infiltration of their walls with nucleated round cells, which also are seen between the glands, give rise to extensive proliferation. Large and numerous vessels with hæmorrhages were visible in the cellular matrix, rendering the appearances similar to those seen in the columnar cancer.) The small celled infiltration makes the diagnosis from sarcoma difficult, and the differentiation of epithelial or sarcomatous cells from inflammatory, when the latter are isolated, not easy.

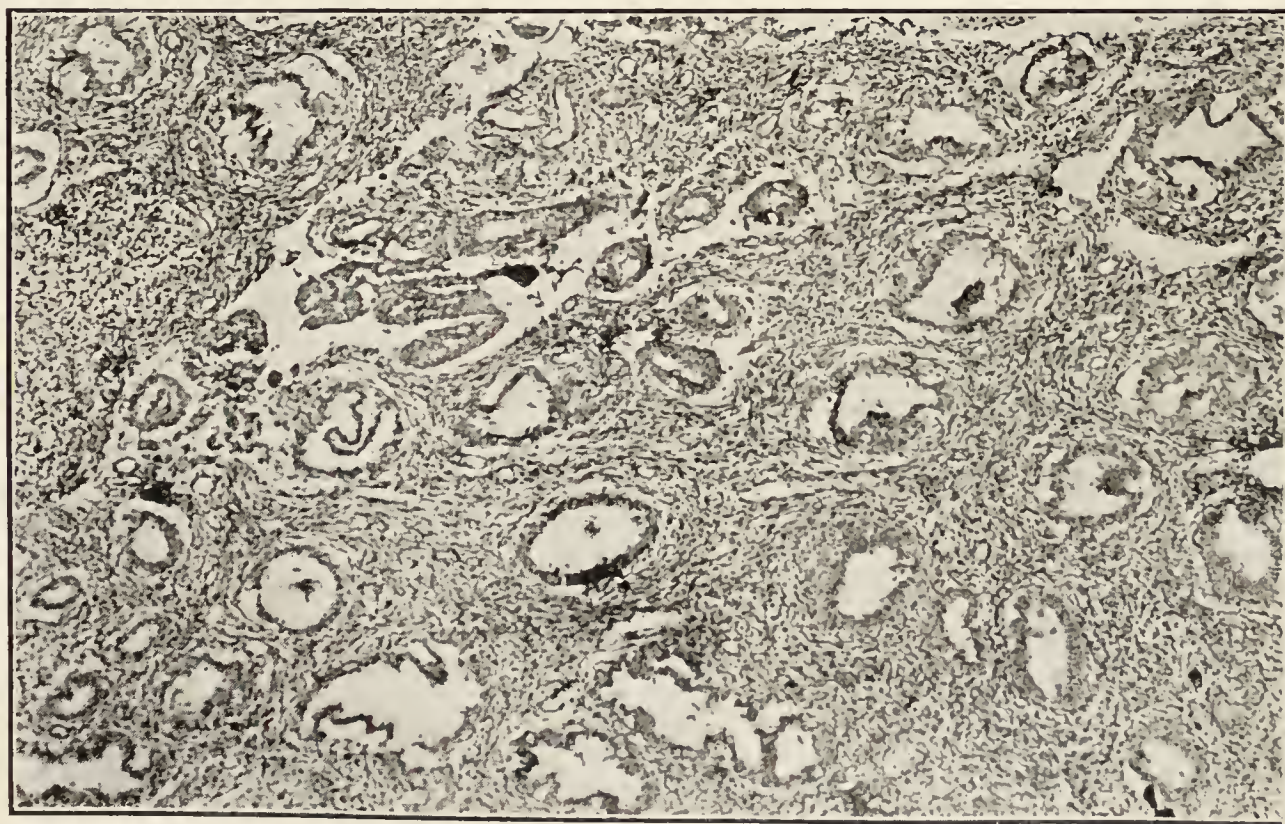
PLATE XVIII.



CURETTINGS FROM A CASE OF GLANDULAR ENDOMETRITIS. (AUTHOR.)

Cystic degeneration in a case of hæmorrhagic endometritis. The tubules were distended into small cysts. There was also much round-celled infiltration of the stroma. [For sequel to this case, see plate over page.]

PLATE XIX.



PORTION OF CURETTINGS TAKEN FROM A CASE OF ENDOMETRITIS WITH FOLLICULAR DEGENERATION OF THE CERVIX AND EROSION. (AUTHOR.)

There is desquamation of the gland epithelium, with œdema of the subjacent muscle.

[To face p. 334.]

PLATE XIXa.

(For the previous curetting
of the uterus, see Plate XVIII.)



DRAWINGS OF THE OVARIES AND PHOTOGRAPH OF THE UTERUS WITH ADNEXA. REDUCED $\frac{1}{3}$. (AUTHOR.)

Removed by supra-vaginal hysterectomy for hæmorrhagic endometritis in patient aged 49, twice previously curetted for hæmorrhage, from interstitial and glandular changes in the endometrium. The ovaries are bisected, showing two cysts in the left filled with blood coagula, and the solitary cyst in the right. (See opposite page.)

PLATE XIXa.—Sequel of Glandular Endometritis. (See Plate XVIII.)

The patient, from whom this uterus and adnexa were removed, was aged 49, height 6 feet 1 inch. She had been twice curetted, and the uterine canal wiped out with chromic acid solution. Before each curettage she was blanched from hæmorrhage, and had a cardiac hæmic murmur, with feeble second sound. Each operation gave temporary relief. The bleeding recurring, I removed the uterus and adnexa by supra-vaginal hysterectomy. The examination of the specimen by Dr. Lockyer showed a thickened endometrium, covered by pultaceous deposit, consisting of epithelial débris. (When the uterus was divided after removal, a quantity of this pultaceous material, closely resembling muco-pus, exuded from the left cornu.) The excessive desquamation of the glands and the accumulation of epithelium explained the collection in the left cornu of this thick débris, not unlike pus. There was a small circular fibroid in the anterior wall. The tubes were slightly swollen and the fimbriæ œdematous. The left ovary contained two small blood cysts. The right had a thin-walled cyst at its inner pole. The patient is now in good health.

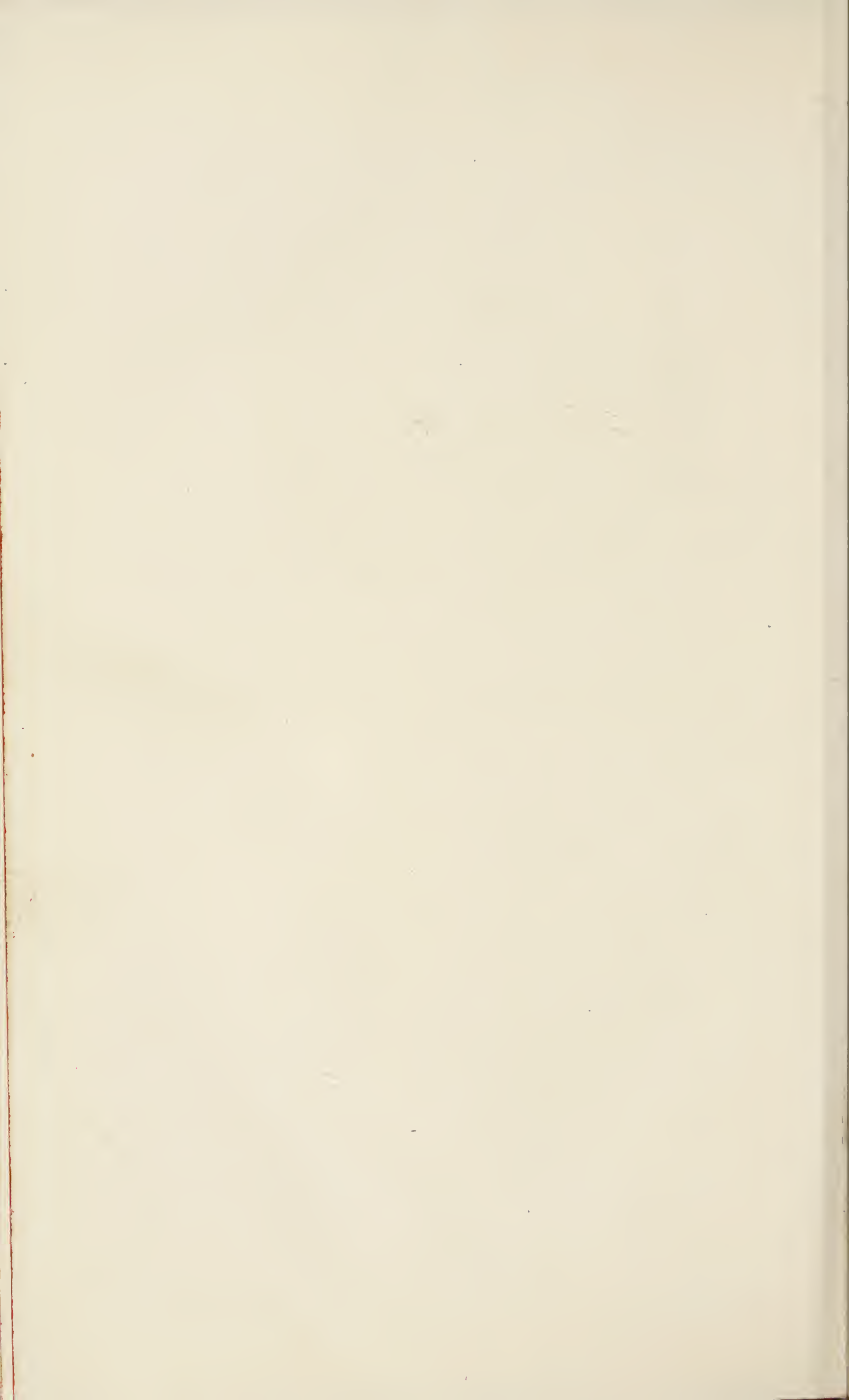




FIG. 241.—HÆMORRHAGIC ENDOMETRITIS. (HIGH POWER.) (SHAW MACKENZIE.)

A, swollen gland; *B*, inflammatory cell proliferation of matrix and blurred vessels in field. A section of curettings in hæmorrhagic endometritis, in which the ultimate ending of the case showed that it was sarcoma; the structure of the interstitial tissue presented a marked deviation from the normal, approaching adeno-sarcoma.



FIG. 242.—‘CATARRHAL’ ENDOMETRITIS. (SHAW MACKENZIE.)

The glands are somewhat enlarged and the cell proliferation is not marked.

In some instances there is simply hyperplasia of the glandular layer of the mucosa without invasion of the uterine wall. These conditions would appear



FIG. 243.—ENDOMETRITIS HYPERPLASTICA.
(AUTHOR.)

to be transitional between benign and malignant, the passage of a benign adenoma into an adeno-carcinoma. In those cases in which the proliferating masses project into the uterine cavity, there is an epithelial proliferating columnar arrangement; here microscopic examination enables us more readily to distinguish the benign from the malignant.

In the case of erosions of the cervix and os care has to be taken in the differential diagnosis from the malignant states. Syphilitic erosions which bleed readily and are associated with an impaired

state of health are apt to be confounded with malignant conditions.

Treatment of Hæmorrhagic Endometritis by Curettage and Chromic Acid.—The conditions which the term 'hæmorrhagic endometritis' involves are various. Operating on a case of this nature, after dilatation, I found a small raspberry-like mass in the uterus. The pathological report pronounced it to be of a decidedly malignant nature. This was many years since, yet the patient is at the present day alive and well.

In previous editions of this work cases have been recorded in which there had been for years continuous hæmorrhage with occasional excessive menorrhagia, completely cured by thorough curettage and the application of chromic acid (one drachm to the ounce solution) with the administration of hydrastis and stypticin. In these cases the general pathological state was infiltration of the stroma of the endometrium with inflammatory products, increase in number of glandular tubules, which were hypertrophied and dilated, and more or less abundance of the cellular stroma.

Vapo-Cauterization of the Uterus.

Though in the last edition of this work, this method of Snégireff (1886) and Pincus (1899) was described, and the appliance of Pincus was figured, I have not resorted to it, being quite satisfied with the other methods of treatment advocated. I then said:—'So far it does not appear that this treatment has any advocates in this country.'

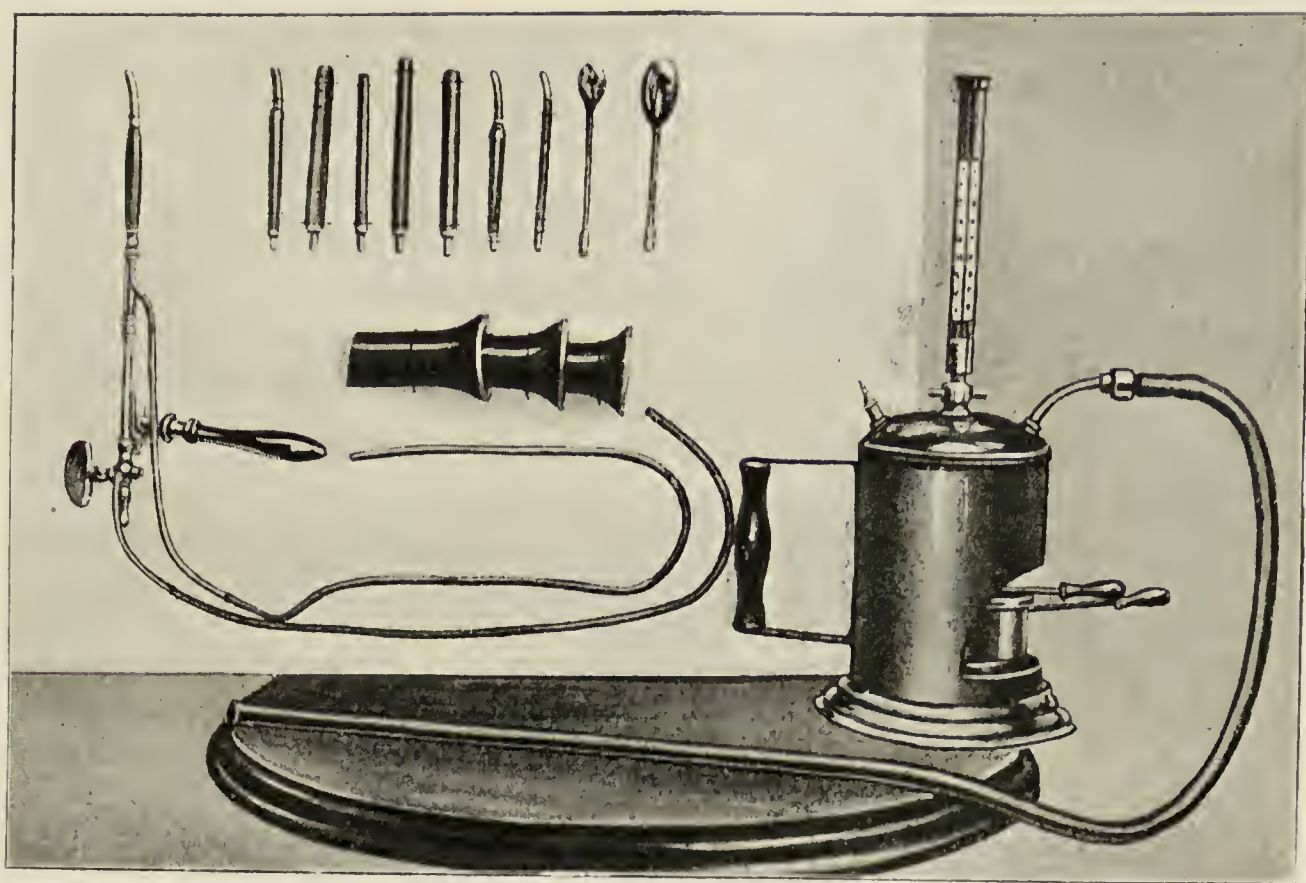


FIG. 243A.—PINCUS' IMPROVED APPARATUS FOR ATMOC AUSIS AND ZESTOC AUSIS. Showing lamp and boiler, with thermometer; also wooden specula, with the steam-conducting tube, the atmocautery and various intra-uterine catheters, some having apertures at the end, some laterally, and others with spiral openings.



FIG. 243B.—UTERUS AND ADNEXA REMOVED BY ATMOC AUSIS. (PINCUS.)
[To face p. 336.]



FIG. 243c.—UTERUS AND ADNEXA REMOVED BY ATMOCALUSIS. (PINCUS.) [To face p. 337.]

This may have been due to unfavourable reports of the treatment. Necrosis of the uterus occurred in a case of Van de Velde's, where every care had been taken with the application of the vapo-cauterization; yet perforation and septic peritonitis followed. The temperature of the steam in this particular case was 105° C.

Since then (1901), however, the method has found favour with several eminent gynæcologists in the United Kingdom, and has been practised with success both in this country and in America. So reliable an authority as Fritsch has pronounced it to be 'safe, painless, and effective,' and others of large experience also assert that it is quite painless. I do not apologize for quoting the clear description of the *modus operandi* given in a review of Pincus' work,* in which the advantages and risks of the method are fully entered into by the author.†

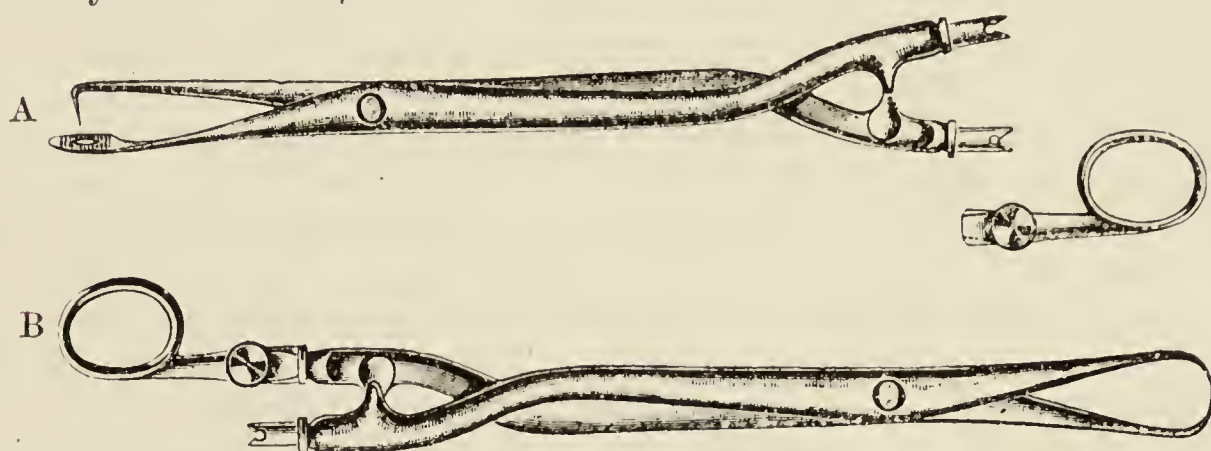


FIG. 244.—A. COMBINATION OF BELL-SHAPED FORCEPS WITH MOVABLE HANDLES. B. TENACULUM WITH SAME.†

'The improved apparatus consists of a boiler of 6-litre capacity, and capable of resisting a pressure of over 2½ atmospheres, in which the steam is generated, and in the top of which a thermometer and a safety valve are fitted. From the upper part of the boiler a curved tube projects, to which is joined an indiarubber tube 1 metre in length. To the end of this is attached the intrauterine catheter itself, made very much on the plan of the ordinary Bozemann's catheter, but having a non-conducting cover fitted over that portion which lies in the cervix, and a tube fitted to the return opening to carry off the waste steam. To the instrument is attached a wooden handle, and just above this there is a two-way cock to regulate the supply of steam to the uterus, the upper part of the tap being of wood, so that the operator may not burn his fingers when using it. If we intend using a temperature from 100° to 105° we fill the boiler one-third full, and if from 105° to 115° one-half full. The indiarubber tube is specially constructed to resist the

* *Brit. Gyn. Jour.*, vol. xxiv., Aug., 1903.

† Since writing the above, I have been favoured by Dr. Pincus with a gift of his work and clichés—'Atmokaussis and Zestokaussis—Die Behandlung mit Hochgespanntem Wasserdampf in der Gynækologie,' etc., by Dr. Ludwig Pincus, Frauenarzt, in Danzig, Wiesbaden. Verlag von T. F. Bergmann, 1903.

‡ See p. 338.

pressure of the superheated steam, and is further strengthened by a covering of close webbing. It should not exceed a metre in length for private practice, though in a clinique it is often well for purposes of demonstration to have it as long as two metres. The non-conducting material used to cover the cervical portion of the catheter is made of a fibre which, manufactured in America by some patent process of subjecting wood shavings to hydraulic pressure, is now extensively used to insulate the various parts of electrical machines. It can be cut and turned like wood, and withstands the action of boiling water (no soda) and of acids very well, and so can be thoroughly disinfected. For cases in which contact burning would be specially dangerous, such as interstitial myomata, the intrauterine portion of the catheter is made entirely of fibre; in others, on the contrary, where contact burning is intended, the uterine piece of the catheter is made entirely of metal, and is not provided with holes, so that it acts like the ordinary thermo-cautery, but in a milder way. There is also another form of metal tap provided, which is larger and flatter, and is used for stopping hæmorrhage in operations on parenchymatous organs.

‘Besides these essential instruments there are some which are of great use if the operator be without skilled assistance, viz. a set of short wooden specula, to prevent the vagina being scalded should the steam escape by accident from the cervix during the operation, and a pair of ordinary bullet forceps, with removable handles. These latter enable us first to fix the cervix with the forceps, and after having removed the handles, to pass the speculum over the blades and then to replace the handles. We can in this way, even when it is considerably displaced, draw the cervix into the speculum.

‘**Preparations for the Operation.**—The patient is placed on her back, the cervix is seized near the commissure with a pair of the special atmocausis forceps, one of the short wooden specula is passed over the forceps, and the handles of the latter, which have been removed to pass the speculum, are replaced. In all cases of preclimacteric hæmorrhage, where there is the least suspicion of malignant disease, this must first be excluded, either by palpation of the interior of the uterus, or by microscopic examination of the mucous membrane, or by both. When using the curette for this purpose special attention should be paid to the fundus and cornua, and, when possible, the atmocausis should not follow immediately on the curetting. The dilatation of the cervix, so as to allow the catheter with its protective covering of fibre to be readily introduced, is the first step in the operation, and if the cervix be rigid, and the symptoms not pressing, is best effected by laminaria tents, more especially if we intend to explore the cavity with the finger, a step which may in the end save time, as it may render curetting unnecessary. Before any attempt is made to introduce the catheter, all mucus, blood clots, or placental remains, must be carefully removed from the interior of the uterus. This is probably best effected by washing out the uterus with a 1 per cent. solution of peroxide of hydrogen. The length of the uterus and of the cervix should be carefully ascertained before the dilatation takes place, and the condition of the walls of the uterus, and the absence of any complication in the adnexa and parametria, determined. In the large majority of cases narcosis is unnecessary. If there be any doubt as to the condition of

the adnexa, the patient must be carefully watched during previous menstruation to find out if there be any evening rise of temperature or swelling of the tubes. If there be any exacerbation during menstruation, or after the systematic application of intrapelvic pressure (*Belastungstherapie*) the case is unsuited for atmocautis or zystocautis.

'The Operation.—The boiler is filled with about 7 ozs. of water for temperatures of 100° to 105° , and 11 ozs. of water for temperatures of 105° to 115° . If there be hæmorrhage it is well to use a three per cent. solution of formalin instead of plain water. For ordinary cases the revolver burner is the best, but for the lower temperatures, or if there be any delay in the operation, the double burner is used, of which only one side need be lighted. If the two-way cock be placed obliquely no steam can escape from the boiler, and consequently the temperature rises quickly, and the rate at which this takes place can be regulated by the amount of steam that is allowed to escape and the sort of burner that is used. The apparatus itself should not be carried about, but should be placed on a table or on a specially constructed stand. As soon as everything is ready the two-way cock is placed transversely, and any condensed water that has collected in the india-rubber tube is expelled. The point of the catheter is now depressed, and the cock turned through a quarter of a circle; the steam then escapes through the catheter, warming the whole apparatus, and clearing out any still remaining water. The cock is now turned back till it is nearly transverse, and, the handle of the instrument being a little depressed, the catheter is quickly introduced into the uterus. As soon as it is well in, the cock is slowly turned so as to point along the tube of the catheter, and the steam is thus gradually admitted into the uterus. We do not, however, count the seconds till the steam begins to escape from the waste steam tube. The catheter should not be allowed to remain in one position in the uterus, but should be moved a little from side to side, so as to avoid the risk of contact necrosis. The fibre cervix protector must never be drawn out so far as to leave the inner os unprotected. The operation should be shortened in proportion to the readiness the uterus shows to contract, the amount of contraction of the uterus being determined by the hand placed on the fundus. Before removing the catheter from the uterus the steam must be shut off by turning the stop-cock either obliquely or transversely. The catheter should at once be removed should the return tube become stopped, except in cases of bad hæmorrhage, for then the stoppage of the tube causes the tension and heat of the steam to rise, and thus increases its hæmostatic action. In other cases the tube should be cleared out thoroughly, the uterus washed out with a 1 per cent. solution of peroxide of hydrogen, and the catheter again introduced. In estimating the time during which the steam should be allowed to work, we must take into consideration the size of the uterine cavity, the thickness of its walls, and, above all, the contractility of its muscular fibre, the rule being to use the highest possible temperature for the shortest possible time. If necessary the operation may be performed in the out-department, but is, of course, safer if done in hospital, and when the patient is in bed.'

In discussing the necessity for narcosis and assistance, whether

the operation should be undertaken by the general practitioner, if ambulant treatment be safe, and the relative positions of atmocausis and zestocausis to the operation of curettage, Pincus arrives at these conclusions. He does not advocate anæsthesia save in exceptional cases, appearing to regard the sensibility of the woman to pain as a safeguard, she being thus able to give the alarm should there be any misapplication in the use of the instrument. He advises that, as a rule, the application should be performed in bed, where the patient can remain for some days, and not in the outpatient department. It is, he considers, also well to have assistance, though it may be dispensed with. He thus proceeds when alone—

‘The stand is placed within easy reach of the right hand of the operator, and the thermometer turned so that the index can be read off. He first takes the atmocautery in the right hand and with the left hand opens the two-way cock, which he shuts again as soon as the condensed water has all escaped. The left hand then grasps the forceps, and the right hand introduces the cautery. The left hand now leaves the forceps and turns on the steam; it is then placed over the fundus to control it, and may pass a couple of times from the fundus to the forceps and back again, as found necessary. Finally, the left hand turns off the steam, again grasps the forceps, and then the right hand removes the atmocautery.’

Pincus (we think wisely) does not approve of the operation being performed by the general practitioner, involving as it does a most accurate diagnosis, and very special experience in gynæcological methods. He considers atmocausis a preferable method of treatment to curettage, though the latter step at the climacteric period should precede the former, an interval of ten to twenty days elapsing between the curettage and the treatment by steam. Only rarely during the childbearing period should the two operations be combined.

The indications for atmocausis or zestocausis may be absolute or relative.

I. Atmocausis is absolutely indicated :—

(a) In all cases of uterine hæmorrhage which we fail to influence or cure by the usual methods.

To these belong : (1) Certain form of preclimacteric hæmorrhage; (2) all cases of hæmophilia; (3) certain cases of bleeding myomata, and of hæmorrhage from inoperable cancer corporis uteri; (4) certain forms of endometritis hæmorrhagica (endometritis hyperplastica, Olshausen); (5) atonic and endometritic hæmorrhage, especially after abortion or late in the puerperium.

(b) To produce sterility in women with incurable diseases.

II. Atmocausis may be relatively indicated :—

(a) In subinvolution, which does not yield to treatment.

(b) In inflammatory affections where the curette is indicated we may use the atmocautery instead of it, or as complementary to it.

(c) In a special class by themselves we place : (1) Endometritis tuberosa ; (2) endometritis gonorrhœica ; (3) endometritis saprica ; (4) endometritis puerperalis septica incipiens.

III. Zestocausis is absolutely indicated :—

(a) When we want to cauterize certain circumscribed portions of the endometrium (cornua).

(b) In certain cases of endometritis dysmenorrhœica.

IV. It is relatively indicated :—

(a) When in a small nulliparous uterus the curette is indicated for inflammation, we may use the zestocausis either instead of it, or in combination with it.

(b) In cases of obstinate endocervicitis and obstinate erosion, as being a milder application than the thermocautery.

(c) In the treatment of obstinate fistula, and in operations on the liver, spleen, etc.

Contra-indications.—These are the same for atmocausis and zestocausis as for all other methods of intrauterine treatment.

The contra-indication is absolute :—

(a) If malignant disease be present.

(b) If there be any inflammatory or painful complications in the adnexæ or the parametria, especially tumours in the tubes.

(c) When there is any exacerbation of the symptoms during menstruation or after treatment by intrapelvic pressure ('Belastungstherapie').

(d) If the patient complain of acute pain during the application of the steam the operation must be at once abandoned.

Zestocausis is contra-indicated in all cases where the uterine walls are thin and relaxed.

It appears obvious, even from the description of the method and the precautions insisted upon by Pincus himself, that this operation is not one to be lightly undertaken. 'The success of atmocausis depends,' he says, 'on the proper selection of the cases and upon proper handling of the apparatus.' At the same time he does not consider it either a substitute or a complement for curettage, which, if efficient, he regards as more severe than either atmocausis or zestocausis, which, if properly applied, is also more decidedly curative.* Nor does my experience accord with his views on curettage, which if thoroughly carried out, with proper aseptic precautions, yields most satisfactory results, and is decidedly curative in the great majority of cases. In obstinate hæmorrhagic endometritis, in adenomatous states of the endometrium, in endometritis hyperplastica and in fungous and septic endometritis, where curettage fails zestocausis may effect a cure and save the uterus from ablation.

* *Monats. f. Geb. u. Gyn.*, bd. xvi., s. 745 ; *Brit. Gyn. Jour.*, Feb., 1903.

It must ever be contra-indicated in a thin-walled uterus, and where there are adnexal complications.

Endometrectomy.

Casati originated, and Dührssen adopted, this method for the treatment of recurrent hæmorrhagic endometritis where curettage had failed. The anterior vaginal vault is opened, and, the anterior wall of the cervix having been exposed, the peritoneum is either detached from it or divided. The uterus is next incised as far as the fundus, and the uterine and cervical mucosa are stripped off. The incision may be of a T shape. It is closed by circular sutures carried round the uterine cavity below the incised surface.*

Chronic Endometritis—Causation (Predisposing and Exciting).—

We may group the causes of chronic endometritis thus :—

1. Predisposing—

Constitutional (tubercle, syphilis, chlorosis).

Defective diet.

Excessive lactation.

Frequent labours and subinvolution.

Mental causes.

2. Exciting—

Excessive coition.

Exposure to cold during menstruation.

Gonorrhœa.

Vaginitis.

Displacements.

Stenosis of cervix.

Polypi.

Laceration of cervix.

Abortion, miscarriage, parturition.

Symptoms and Physical Signs.—The chief are pelvic pains and backache, attended by difficulty in walking ; leucorrhœa of a viscid character ; occasionally vaginitis ; dysmenorrhœa ; dyspareunia ; sterility, from the impediment to the passage of the semen, and the action of the secretion on the spermatozoa ; deterioration in the general health.

On examination by the finger and speculum, we often find the lips of the os uteri swollen, or denuded of its epithelium, and some surrounding erosion or granular degeneration of the adjacent cervix. Occasionally there is the characteristic viscid discharge blocking

* *Centralb. f. Gyn.*, s. 1353, 1898.

up the cervix, which is removed with difficulty. A version or flexion may be detected.

Prognosis.—As it is the most frequent, so is it often the most inveterate of uterine morbid states. Even if we succeed in altering the nature of the secretion, and finally arrest it, a lull in the treatment is occasionally followed by a return of the old complaint in as aggravated a form as before. The longer the affection has lasted, and the more copious and viscid the discharge, especially in those cases in which the uterus is malformed or displaced, the worse is the prognosis.

Treatment (Local Therapeutic Measures).—The methods of applying various substances to the interior of the uterus, and the manner of dressing the cervix have been referred to. The first and most important point to decide is, whether the inflammation be localized in the cervix, or involve the fundus. In this we must be guided by the character of the discharge, and the size and sensitiveness of the body of the uterus. We must also in all cases make a careful bi-manual examination of the adnexa, and satisfy ourselves as to their condition. If there be adnexal disease this will necessarily influence our decision as to the line of treatment we should adopt.

Assuming that the cervix alone is inflamed in a case in which the cervical canal is narrow and where there is stenosis of the isthmus, our first step should be to secure such dilatation of the cervical canal as will permit of the free flow of any discharge, and allow room for a topical application to the mucous membrane. This is best done by division and dilatation of the cervix in the manner already described. The loss of blood consequent upon the incisions will be of service.

The hot vaginal douche may be used either with borax, carbonate of soda, boiled starch, Condyl's fluid, laudanum, tincture of iodine, or liquid extract of hydrastis added to the water. Kreuznach *mütter lauge* or that of Woodhall is an excellent addition (two ounces to the quart). Depletion of the cervix repeated a few times hastens the cure. Such applications as carbolic acid and glycerine, ichthyol and glycerine, formic-aldehyd 10 to 20 per cent., extract of hydrastis and glycerine, liniment or tincture of iodine and glycerine, chromic acid solution, nitrate of silver, Braxton Hicks' fused zinc crayons, or those of iodoform, are useful. The nitrate of silver may be applied on a uterine probe, by first fusing a little of the silver salt in a small crucible (Fig. 124) over a spirit-lamp, and then dipping

the point of the probe into the cup, so as to get a film of the nitrate of silver on it. But by far the most efficient and perfectly safe agent, when applied with due care, is fuming nitric acid. (See page 142 for full directions for its application.) After making use of any of these agents, a glycerine tampon should be passed into the vagina.

Menge first advocated the application of formalin on hard rubber rods, in strengths varying from 20 to 50 per cent. I have used these rods for some time, and find that they are not acted upon by the solution. (Schaedel, Leipzig.) Smyly also speaks highly of formalin. Ichthyol solution, 10 to



FIG. 245.—DRESSING THE CERVIX WITH SIMS' SPECULUM AND UTERINE PROBE IN THE LATERAL POSITION.

20 per cent., is another efficient application in chronic inflammatory states of the cervical endometrium. It may also be administered with benefit internally. Like many other vaunted remedies, it fails in some cases to give any result. In the majority of cases of cervical endometritis, the most rapid cure follows curettage of the affected canal, and the application of chromic acid.

General Treatment.—The patient must abstain from coitus; have as much outdoor exercise as is suitable to her strength; much standing is to be avoided. Change of air, proper tepid bathing of the body, simple, yet nutritious, diet, moderation in alcohol, long

hours of rest, careful attention to the secretions, are all important aids towards curing the disease. The most valuable medicines are arsenic, quinine, hydrastis, ichthyol, viburnum prunifolium, the mineral acids with the vegetable tonics, bark, calumba, gentian, nux vomica. If there be nervous excitement and much pain, heroin and the bromides are indicated.

Chronic Corporeal Endometritis.

While it is of the utmost importance to recognize the clinical fact that chronic cervical endometritis *per se* is a frequently occurring affection of the uterus, it must not be thought that endometritis of the body is ordinarily met with apart from the cervical catarrh. On the contrary, *the corporeal inflammation is generally attended by varying degrees of cervical endometritis*. In chronic corporeal endometritis, not only are the utricular glands of the body involved, but also those of Naboth in the cervix. The exaggeration of the natural secretion from the utricular glands is the most prominent sign of the affection. Post-mortem examinations show that the mucous membrane is found, at the commencement of this disorder, swollen and reddened; later on it is paler and of a gray colour. Finally, the glands are atrophied, the mucous membrane is deprived of epithelium, and the deeper layers form sprouting granulations, which at times assume the appearance of small polypi.

The cavity of the body is enlarged when the disease lasts for any length of time, and there may be a mere lining of connective tissue, which takes the place of the natural mucous membrane.

Causation.—All those causes which operate in producing the cervical, likewise bring about the corporeal endometritis. There are a few uterine affections with which the latter condition is constantly associated, or that it is a sequence of—

- Subinvolution of the uterus.
- Abortion and miscarriage.
- Obstructive dysmenorrhœa.
- Displacement.
- Gonorrhœa.
- Vaginitis.

It may also follow prolonged lactation.

Symptoms and Physical Signs.—The principal are a glairy discharge, at times coloured, and tinged with blood, or purulent

and shreddy ; amenorrhœa, dysmenorrhœa, or metrorrhagia ; all the symptoms already noted of cervical endometritis in an aggravated form. Frequently there is enlargement of the uterine canal, and increased sensitiveness of the entire uterus, which by bimanual examination is found enlarged.

Treatment.—Various useful local applications have been already alluded to in the treatment of this affection. Intra-uterine medication and the different methods of applying absorbent, emollient, stimulant and caustic remedies to the uterine cavity have been referred to. The special dangers of intra-uterine injections have also been pointed out. Any or every form of local application will fail in some long-existing cases of corporeal endometritis. In practice the following are the most efficient methods of treatment of corporeal endometritis.

1. Constitutional treatment, such as that indicated in endocervicitis.

2. Dilatation of the internal os with dilators or tents.

3. Curettage, followed by the application of chromic acid, especially if there be reason to suspect a granular condition, or fungosities.

In an obstinate case of chronic endometritis we should at once proceed to curette the cavity, and combine this treatment with drainage and subsequent cleansings as advised in the directions for the operation of curettage.

4. Other intra-uterine medication, especially carbolic acid and iodine, formic aldehyd, ichthyol ten per cent. solution, extract of hydrastis, may first be tried.

5. *The application of nitric acid to the cavity of the fundus.* I regard this, after curettage, as the most certain means of dealing with the disease. It has, however, the disadvantage of cauterization, and its effects on the endometrium. I therefore rarely employ it now, as curettage and chromic acid answer every purpose—*always providing that the curettage be thorough*, and that chromic acid in solution be subsequently applied.

6. Depletion of the cervix.

7. The vaginal douche, using with it iodine, borax, carbonate of soda, Kreuznach water (the mother-liquor of the same spa), or that of Woodhall.

8. The persistent use of glycerine with hydrastis and ichthyol tampons.

9. If a displacement exist, rectify it and adjust a pessary, when the inflammatory state has been treated for some time.

Zinc Chloride Treatment.—The cauterization of the uterine canal with *zinc chloride* as a means of treating chronic enlargement of the uterus has been practised by Rheinstädter, Dumontpallier, Fraenkell, and others. The zinc (grs. xxx.—ʒi. to the ounce) is applied twice in the week. The vagina should be carefully protected, and any of the solution that may touch the vaginal wall should be immediately neutralized with bicarbonate of soda.

The practitioner in using zinc chloride will find it safer to adopt the precaution *advised in the application of all powerful intra-uterine medicaments*, of securing sufficient patency of the cervical isthmus, avoiding excess of the solution applied, and giving due attention to the time of application as regards the occurrence of the catamenial flow. The value of iodoform gauze, whether alone or combined with curetting, as an intra-uterine dressing and as a vaginal tampon, I have before alluded to.

Galvano-chemical Cauterization.

G. Apostoli, of Paris, treated chronic metritis by means of the galvanic current, beginning with a weak current at first (20 or 30 up to 80 milliamperes at the first sitting), and gradually reaching 200 milliamperes. Ten minutes is the time allowed for a sitting. The positive pole is placed in the uterus in hæmorrhagic and ulcerative states, the negative in other conditions. At all sittings the strength of the current is to be increased gradually, and, if rest in bed cannot be secured, once a week is often enough to operate, otherwise twice weekly. Coitus must not be permitted. Pregnancy is to be first carefully excluded. Any existing or recent perimetritis will contra-indicate the treatment. Apostoli claimed for this method—

1. Its ease of application and harmlessness.
2. The gradual nature of the cauterization, which is always under control.
3. Its chemical as well as caustic action.
4. It may be used either to restrain hæmorrhage or reduce congestion.*

Syphilitic Endometritis.

Syphilis.—The occasional relation of syphilis to chronic inflammatory states of the endometrium should not be forgotten. I can most strongly recommend the *tannate of mercury* in all secondary or tertiary syphilitic affections. Both it and the bichloride of mercury (as elsewhere advised) are admirable preparations of mercury to administer to women. A pill of—

Hydrarg. tannatis, gr. ss. to gr. i.
Quinæ sulph., gr. i.
Ext. gentian, q.s.,

to which, if necessary, $\frac{1}{56}$ to $\frac{1}{50}$ of a grain of arsenious acid may be added, will be found a most effectual remedy in chronic or recurrent syphilitic states. With either of these preparations of mercury, this mixture of the three iodides of potassium, sodium, and ammonium, may be combined.†

* Electro-therapeutics: see chapter on Electro-therapeutics.

† See chapter on the Vulva for further remarks on Syphilitic Conditions of the Genitalia.

Microscopical Diagnosis of Growths of the Cervix Uteri.

In the face of the difficulty of diagnosis of morbid growths of the uterus by means of the microscope, and the various appearances presented at different periods of life by the normal uterine tissues, it is clear that only experienced experts should venture to decide upon the nature of the tissue examined as to its benign, tubercular, or malignant character. Plimmer* gives the following instructions as regards the immediate treatment of a portion of tissue which has to be submitted to a further examination: place first in a solution of—

Sodium chloride, 7·5 gr.
Glacial acetic acid, 10 c.c.
Distilled water, 1 litre.
Mercuric chloride to saturation.

Next wash in running water for two or three hours, and then place in 50 per cent. of alcohol for twenty-four hours. After this, immerse in 90 per cent. of alcohol for twenty-four hours, and finally in absolute alcohol for twenty-four hours. This process is pursued before the portion is passed through cedar-oil into paraffin, or cut with a freezing microtome, or a rocking or paraffin microtome. This method of ready preparation of a specimen is one at hand for every one. It is better, when possible, to cut out a piece or pieces from different parts, which shall include both the mucous membrane and a small portion of the underlying muscular layer, and when the curette is used for diagnosis, the surface of the muscular layer should be included. In the conduct and supervision of any case of cervical disease, whether it be simple hyperplasia, any form of erosion, hypertrophy, polypi, or adenomatous growths, a careful pathological report should be obtained as to the nature of the affected tissues.

I can only repeat here the caution, several times reiterated in this work, that in the treatment of all suspicious chronic enlargements of the uterus, we should satisfy ourselves thoroughly as to the condition of the endometrium by the assistance of dilatation, the dull curette, and the microscope. These aids to diagnosis become the more necessary when we have—

Cystic and follicular degeneration of the cervix.
Shreddy discharges from the uterine canal.
Softness and tenderness of the uterine walls.
Any foul-smelling discharge.
A recurring sanious flow.

We may also thus early detect histologically the presence of tubercle or cancer.

* *Brit. Gyn. Jour.*, Nov., 1895.

Subinvolution following Labour.

Pathology.—The entire organ is enlarged, its walls are thickened, and its cavity increased in size. We best understand the causes of this increase when we recollect the changes which occur in the tissues—muscular, cellular, lymphatic, and vascular—of the pregnant uterus from conception to full term. The period of complete development is arrived at when parturition occurs. After labour there is a process of ‘retrograde metamorphosis,’ when the uterus, especially during the puerperal month, passes through the series of changes that constitute involution. Absorption of *débris*, fatty degeneration of the muscular tissue, and formation of new elements, are briefly the means by which this change is accomplished and completed, in a period of from six to eight weeks. Should this katabolic process be arrested from any cause, we have an unabsorbed fatty *débris*; enlarged muscular fibres, with embryonic elements of new tissue; hypertrophied areolar tissue; increased size, both of the bloodvessels and lymphatics. While the muscular elements remain thus stationary, or after a little time commence to atrophy, there is hypertrophy and increase of the connective tissue, and the uterus is arrested in a state of general congestion, with enlarged vessels. The hyperplasia of the muscular fibres is an essential part of the process, the augmentation in the connective tissue influencing it but little (Finn, St. Petersburg). The number of muscular fibres is always increased. There is no difficulty in understanding why hyperplastic deposits and rapid development of connective tissue follow. This hyperplasia is the essential pathological condition of the affection. As occurs elsewhere, the connective-tissue growth strangles the vessels, and consecutive atrophy follows. Change in colour and size of the uterus is the result. The last stage is one of contraction and shrinking.

Apart from pregnancy and labour the surgeon often meets cases in which, with cervical endometritis, there is considerable enlargement and subinvolution of the uterus. In virgins we frequently find considerable uterine enlargement, not myomatous, associated with displacement.

We constantly see patients, married and single, in whom the cavity of the uterus is enlarged to the extent of three inches and over, who are nulliparous. Sclerosis of the uterine parenchyma, some version or flexion, and a chronic endocervicitis are present. Thus, chronic congestion leading to transudation, hypertrophy,

enlargement of the uterus, hyperplastic change with cellular tissue

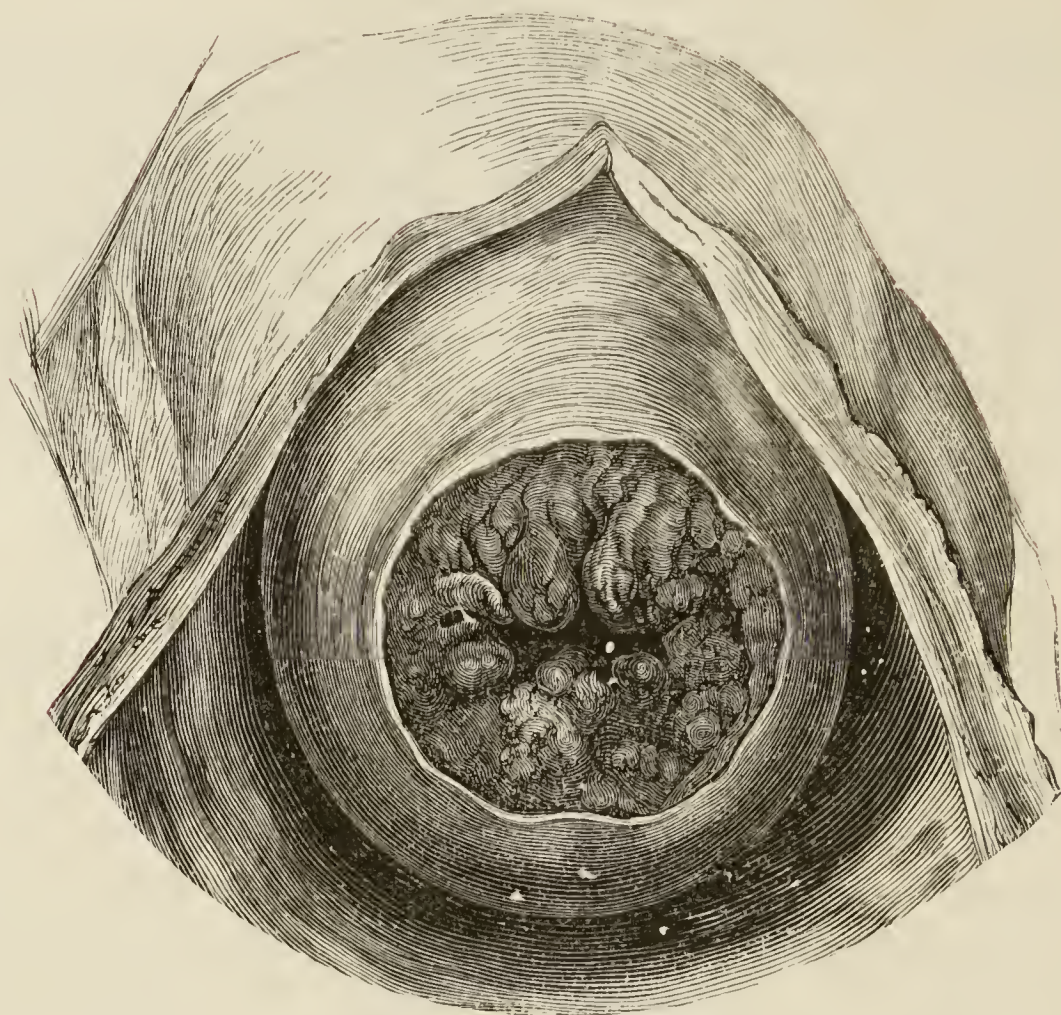


FIG. 246.—EPITHELIAL DENUDATION AROUND THE OS UTERI, SHOWING EFFECTS OF LABOUR ONE MONTH AFTER PARTURITION. (ROBERT BARNES.)

formation, may, and frequently do, arise in other ways than as a sequence of pregnancy.

Causation.—We find most frequently the causes of subinvolution in parturition and neglect during the puerperal month ; as standing, or over-exertion too soon after delivery ; puerperal peritonitis, or metritis ; laceration of the cervix ; endometritis, corporeal and cervical, and the causes which produce these states ; frequent pregnancies ; prolonged lactation ; versions and flexions.

Diagnosis.—By digital examination, if the cervix be involved, we detect a rather open os, which is swollen and painful ; a sensitive, though somewhat hard, cervix, which has descended in the pelvis. The uterus is generally either abnormally anteverted or retroverted, more frequently the former. By bimanual examination the body of the uterus is found enlarged, and by careful palpation the fundus is discovered, unless it be retroverted, above the pubes. The uterine sound passes for the extent of three or three and a half inches. The history of the case, pointing either to an old endometritis, a recent parturition or abortion, or irregularity in the

menstrual flow, will confirm the diagnosis. *The chance of conception and pregnancy must be carefully remembered*; and if any doubt exist, the passage of the uterine sound should be postponed.

There are some *negative* signs it is well to remember in differentiating this affection from pregnancy or malignancy. The cervix is rarely soft; there is no progressive enlargement of the uterus from month to month; the uterus does not generally increase in size beyond three and a half to four inches; the other signs and symptoms of pregnancy are absent; there is not the cachexia of cancer; the discharge, if any, is not foul-smelling; there is not the pain of malignant disease. With these facts in our mind, we are not likely to mistake chronic hyperplasia for either early pregnancy or cancer of the uterus.

Symptoms.—There is scarcely any symptom, either constitutional or local, attendant upon a uterine affection, that a woman afflicted with chronic hyperplasia of the womb may not suffer from. To enumerate these would be to recapitulate all the various pelvic pains and reflex disturbances which arise from chronic endometritis. The more prominent symptoms usually are: difficulty in walking, lumbar and sacral pain, pelvic distress from pressure on the bladder or rectum, nausea, dyspareunia, loss of appetite, and various nervous disorders. If the fundus be the part principally engaged, there is very often menorrhagia or metrorrhagia.

Treatment.—If inflammatory conditions of the endometrium are present, these must be treated in the manner already indicated. This is one of the exceptions in which the hot vaginal douche (medicated) is of use. The uterus should at intervals be freely depleted, and glycerine and ichthyol or iodized tampons used.

Sexual intercourse must be avoided. Weir Mitchell's rest plan may be tried, in the manner detailed at p. 202. To those who can afford it, a course of waters and baths at Kreuznach, Woodhall Spa, Salsomaggiore, Kissingen, or Ems, may be recommended; Schwalbach, Barrèges, or Spa, if a ferruginous spa is indicated. Royat, with its arsenical and iron water, and Bourboule with its stronger arsenical springs, are among the most valuable arsenical spas in Europe. At all times change of air, and, in the summer, temporary residence by the seaside—and no country is more rich in health-giving seacoast resorts than England—will do much to assist the treatment. Where the patient cannot go to the seaside, the seaweed-essence gives an admirable salt-water bath at home.

CHAPTER XVI.

EROSION, GRANULAR AND FOLLICULAR DEGENERATION OF THE CERVIX.

Pathology.—The term ‘ulceration’ of the uterus has disappeared from the vocabulary of the gynæcologist. (This remark does not, of course, apply to the consequences of malignant and syphilitic diseases of the cervix.) The common condition which was ordinarily regarded as one of ulceration has been proved to be nothing more than a desquamation of the superficial epithelial layer covering the lips of the os uteri and cervix.

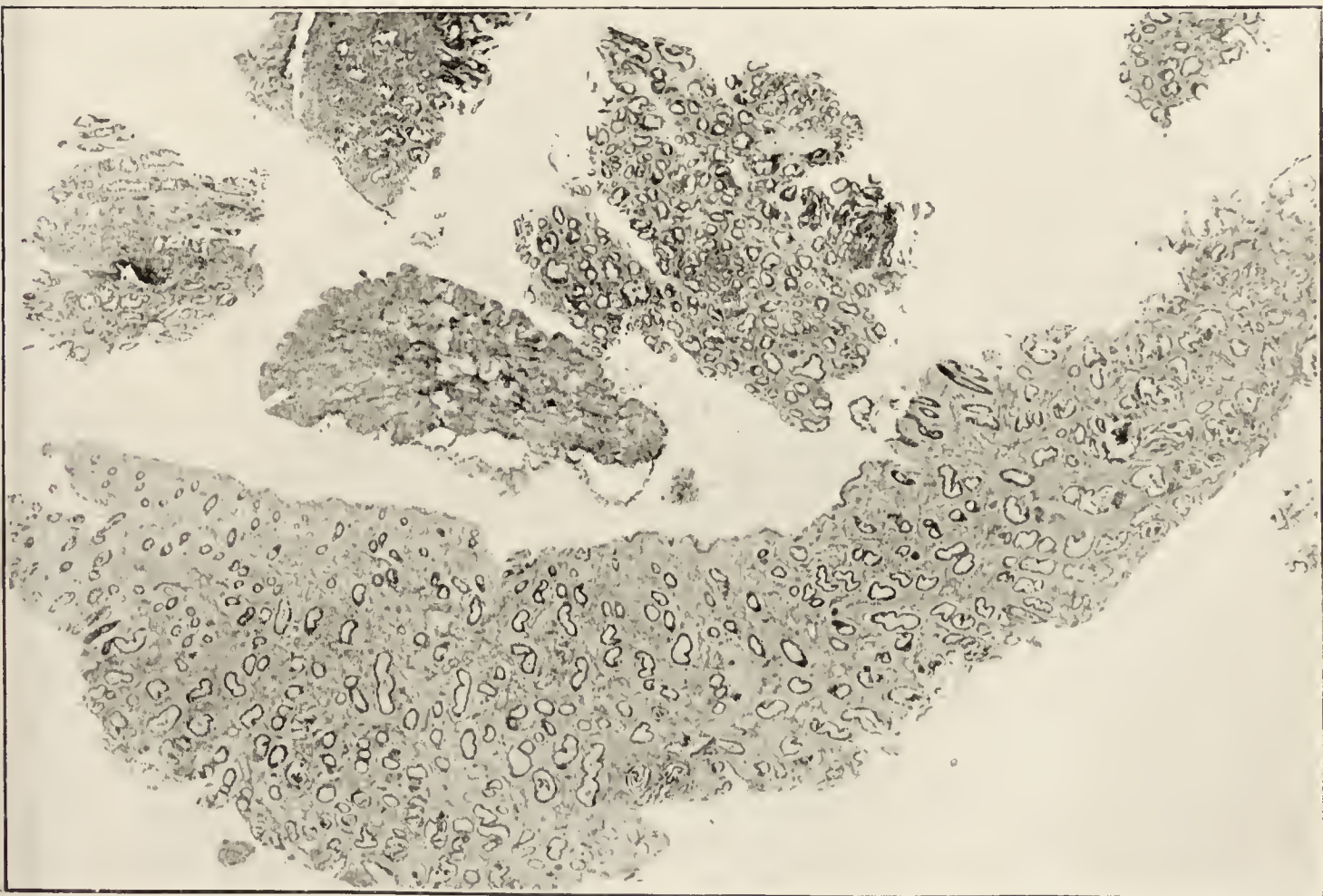
This is attended by increased vascularity and growth of villous prejections, which protrude on the surface under a single layer of epithelial cells. The bright spots seen within the area of the eroded or granular patch were regarded as hypertrophied papillæ, enlarged and highly vascular. Thus, Scanzoni described an ‘aphthous’ erosion, in which the mucous membrane is denuded of epithelium; and Schröder included a notice of ‘ulcers’ of the cervix with ‘erosions,’ and described a papillary form of erosion in which the papillæ develop into ‘granular elevations.’ According, however, to Ruge and Veit, the raw surface is covered with a single layer of epithelium, and the supposed papillary granulations are neoplastic formations. Recesses are formed by extensions inwards of the epithelium, and thus a papillary or villous appearance is given to the erosion. Friction, even such as is necessitated in wiping away the thick purulent secretion which is found covering the cervix, causes bleeding from the superficial bloodvessels. This state has received the name in this country of ‘cock’s comb’ ulcer or granulation, but the accompanying change in the follicles of the cervix is not to be lost sight of. The glands are distended, and the openings are gradually closed, through swelling of the adjacent tissue or the formation of new connective tissue. Cysts are formed, some of which may burst on the surface and discharge their contents. This cystic degeneration may involve the entire cervix.

PLATE XX.



TRANSVERSE SECTION OF ONE HALF OF THE PORTIO IN A CASE OF SEVERE EROSION AND CYSTIC DEGENERATION OF THE CERVICAL MUCOSA.

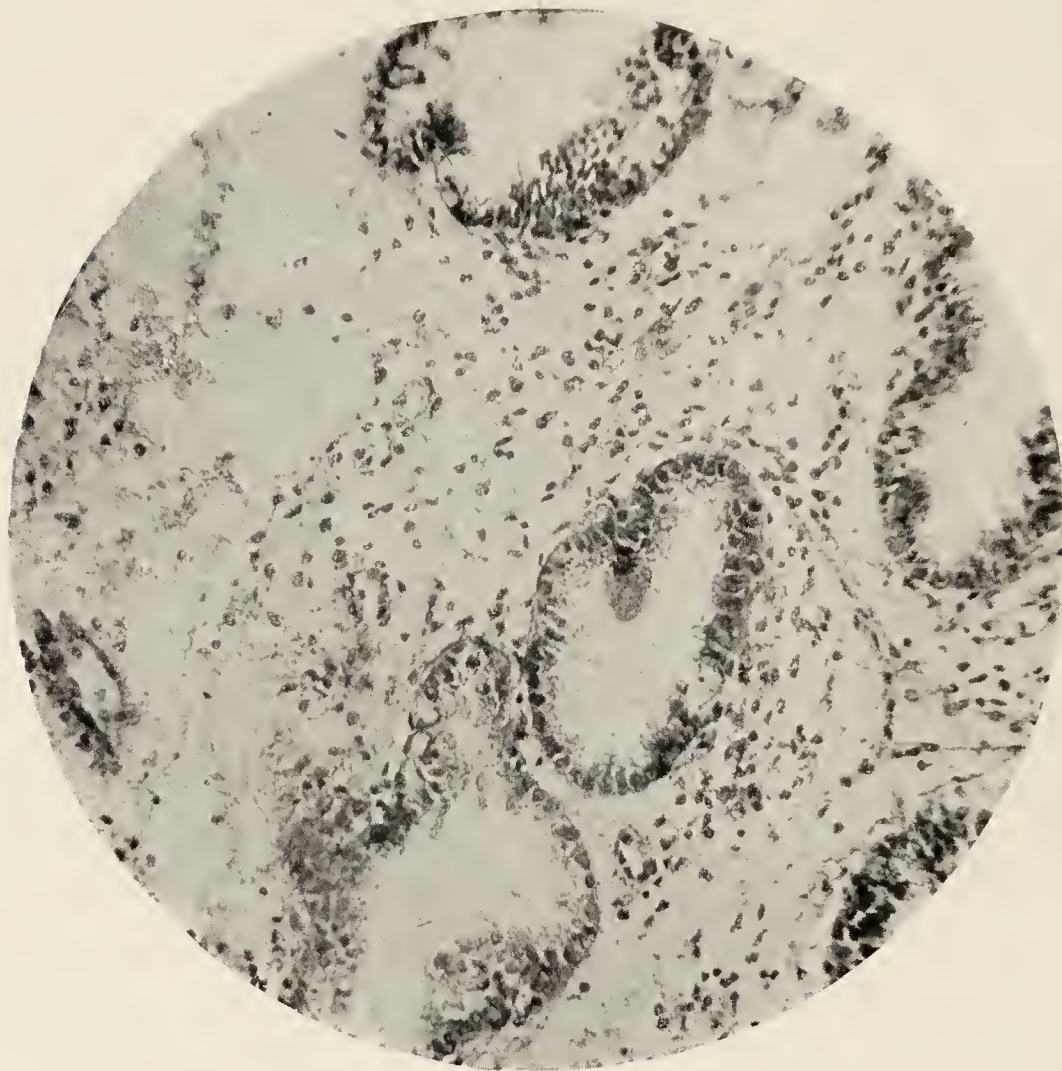
PLATE XXI.



CURETTINGS OF GLANDULAR ENDOMETRITIS—TAKEN FROM SAME CASE.

[To face p. 352.]

PLATE XXII.



SECTION FROM A DEEP EROSION OF THE CERVIX UTERI, ASSOCIATED WITH
GLANDULAR ENDOMETRITIS.

($\frac{1}{6}$ objective.)

PLATE XXIII.



CURETTINGS FROM A CASE OF ENDOMETRITIS DUE TO GONOCOCCUS.

[To face p. 353.]

Plimmer, in a paper on 'The Diagnosis of Growths of the Cervix Uteri,'* says—

Varieties of Erosion.

'As regards the so-called "erosions," they are characterized by the vaginal surface of the cervix, which is normally covered by squamous epithelium, getting covered by more or less cylindrical epithelium, which may sometimes even dip a little into the tissues. This condition is really so like ectropion that it is only in a virgin uterus that it can be easily differentiated. A real erosion in the pathological sense it is not, but rather the covering of a surface with columnar epithelium, which normally would be covered with squamous epithelium. There is here not much change in the connective-tissue stroma, and only a small quantity of round-celled infiltration. The dipping of the

columnar epithelium into the tissues forms gland-like formations, which, however, are much shorter than the ordinary cervical glands. This is the condition usually called "*erosio simplex*." When this columnar epithelium sinks deeper into the connective-tissue stroma, and is raised to the original level of the surface, small pseudo-papillæ are formed; this is the so-called "*erosio papillaris*." Again, if the surface be flatter, and more columnar epithelium is cut off in the deeper parts, it is called "*erosio follicularis*." But these old distinctions are not clear, nor are they ever

separated in a typical case, so the characteristics of erosion mentioned before are better; namely, the covering of a part of the cervix, normally covered with squamous epithelium, with columnar epithelium which dips more or less deeply into the connective-tissue stroma; and characteristic also of "erosion" is it that this part of the connective-tissue stroma, which is normally free from glands, has a number of gland-like bodies produced in it, concurrently with the covering of its surface with cylindrical epithelium.

'There are also, no doubt, cancerous erosions, but in my opinion and in that of many Continental writers the relations of erosions to cancer have been much overrated. Usually, in the cases in which the "erosion" appearances described above are seen, there will be no cancer found.'

Causation.—Erosion of the cervix, with cervical catarrh, is perhaps the most common of all the diseased conditions of the uterus

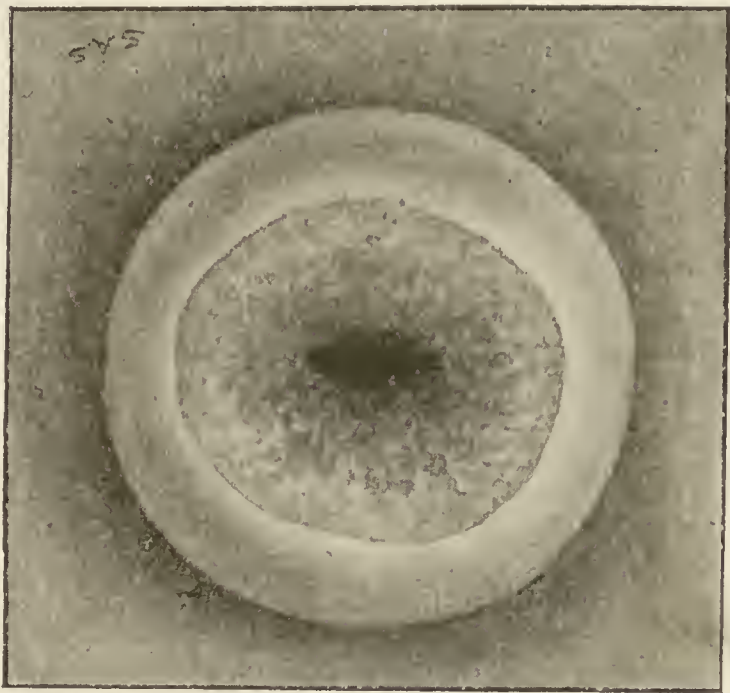


FIG. 247.—EROSION OF THE CERVIX AND OS UTERI. (AUTHOR.)†

* *Brit. Gyn. Jour.*, Nov., 1895.

† See chapter on Laceration of the Cervix.

which we are called on to treat. This does not surprise us, when we remember that it may attend on all the other congested states of the uterus and cervix that we meet with in practice: as, for example, endometritis, displacements, lacerations of the cervix, and vaginitis. We find it present in tubercular, syphilitic, and strumous constitutions. It may be induced or aggravated by the use of a pessary. I feel certain that this latter habit acts more frequently as an exciting cause than is generally thought.

Symptoms and Physical Signs.—These will in great measure depend upon the degree to which the uterus is involved in any coexisting disease, such as endometritis, hyperplasia, vaginitis, gonorrhœal infection. Coloured leucorrhœal discharge, pain when walking or standing, lumbar and sacral pain, dyspareunia, general lassitude, inability to undergo fatigue or any exertion, and loss of appetite, are among the symptoms most frequently complained of. On digital examination, the os uteri feels soft and moist, and the granular or eroded surface is felt by the finger. The os uteri and adjacent cervix are seen covered with a creamy discharge, perhaps tinged with blood. When this is wiped off with a little cotton-wool, the underlying eroded or granular surface is seen. Frequently there is a fissure of the cervix, the result of an old laceration. The os and cervix bleed readily when they are wiped with a sponge or wool. If endometritis coexist, the characteristic discharge issues from the os uteri. If there has been gonorrhœa, the uterine discharge is purulent, of a dirty yellow colour, covering the surface of the wool like a layer of discoloured cream. It has a slight fœtor. In these cases also there is accompanying vaginitis, and probably, if the disease be chronic, an accompanying granular condition of the vagina.

Treatment.—There are some general hints regarding the treatment of erosion of the cervix I think it well to emphasize:—

Give a guarded opinion in reply to the question of the patient or friend, as to the length of time a severe erosion or granular condition of the cervix will take to heal. The affection, especially if there be any coexisting disease of the uterus, must be tedious.

A fair judgment may be formed from the subsidence of the villous projections; the disappearance of granulations; the paleness of the exposed surface, and its diminished vascularity; the diminution of discharge.

There is a danger of *over-treating* this affection by too frequent use of caustics or astringents. The strength of every application

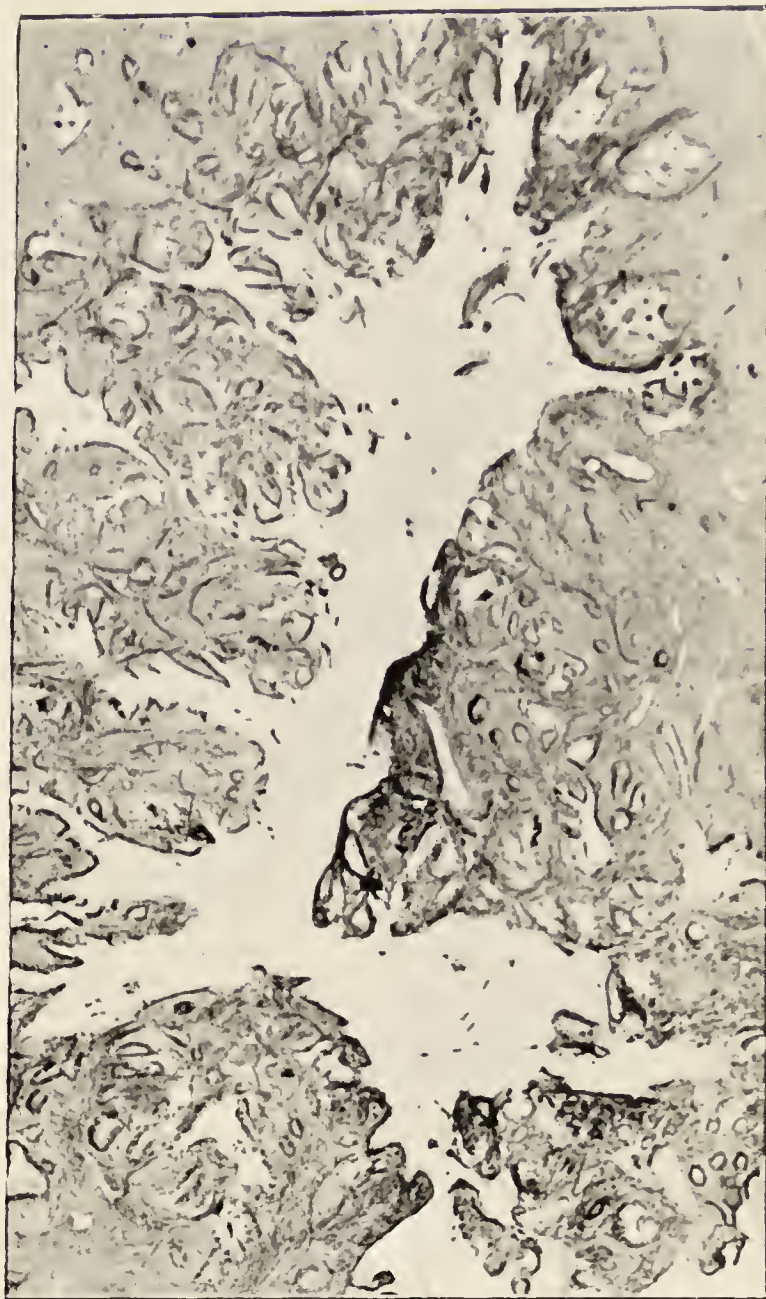


ON OF AN ADENOMYOMATOUS CERVIX, TAKEN
M AN ERODED SURFACE. ENLARGED $4\frac{1}{2}$ TIMES.
(THOR.)

PLATE XXVA.

A SECTION FROM
CLOSE TO CENTRE.
 $\times 140$.

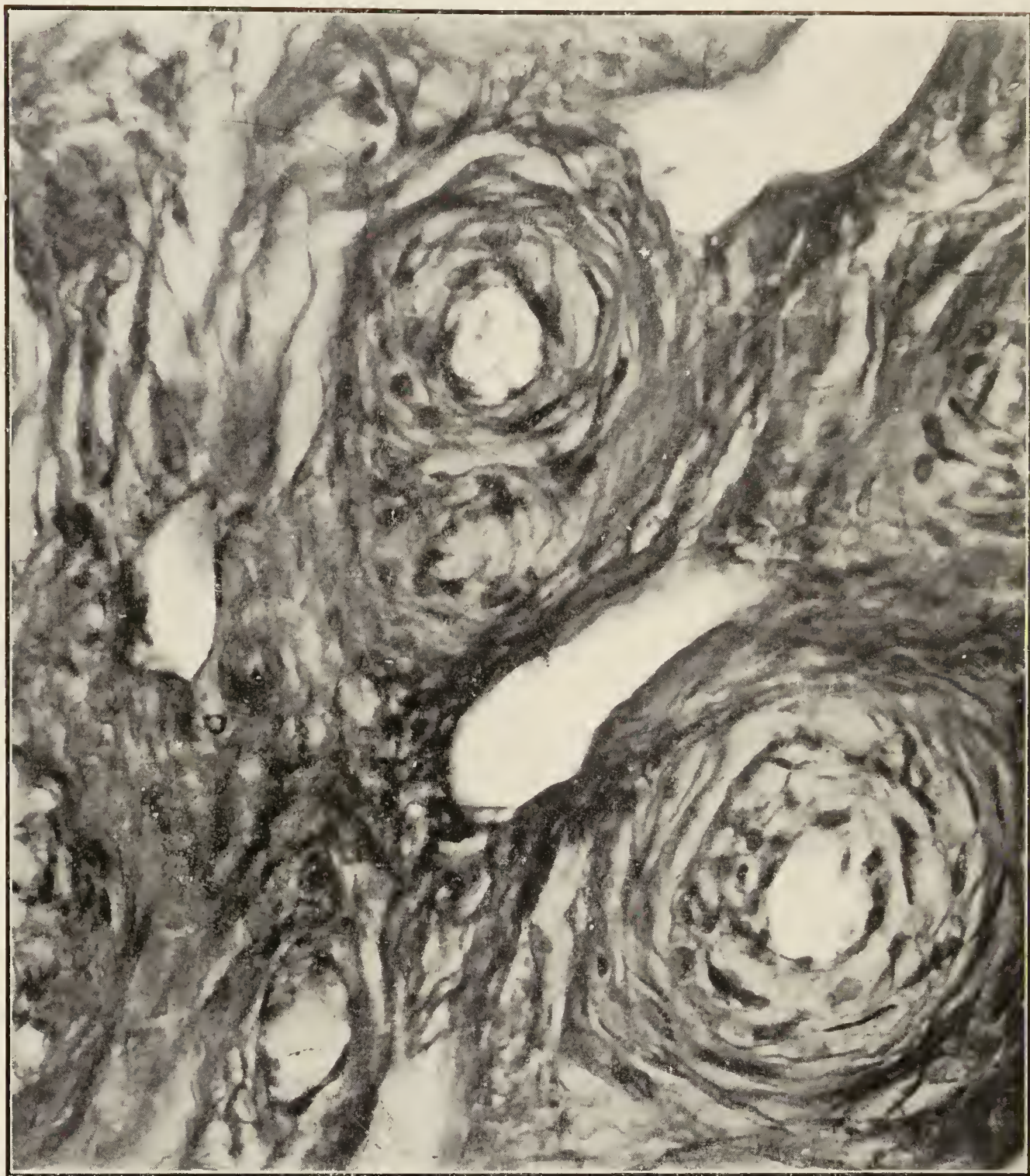
See over page for
microscopic report.



PORTION OF CENTRAL CAVITY. ENLARGED 20
TIMES.—This shaving of tissue was taken
from a cervix which had been previously
operated upon, leaving a granulated surface.
Examination was made of a transverse sec-
tion across the canal to determine malig-
nancy. This area shows an open cleft with
fimbriated margins; somewhat like a broken-
down gland or abscess cavity.



PLATE XXV_B.



Report.—‘Microscopically the central part consists of glandular tissue having a benign arrangement, *i.e.* the basement membrane of the various tubules is intact, but there is much degeneration and breaking down of the gland structure as a whole. The tubules trespass into the surrounding fibromuscular tissue, and the latter is characterized by its extreme vascularity. The numerous vessels all possess very thick walls; some are quite obliterated by the increase in thickness of the walls, having caused occlusion of their lumina. The specimen presents the features of an adenomyoma.’ (× 500.)

[To face p. 355.]

must be regulated by the severity of the case, and determined by the surgical instinct of the practitioner. No routine rule of using this or that strength of any agent should be followed.

As much reliance should be placed on physiological rest and soothing applications as on local medication.

Do not pronounce the case *cured* until the surface has completely healed and the patient has been subsequently under observation for a short time.

When a patient presents herself with an eroded cervical surface, the first point for the surgeon to determine, and on this not a little of his future peace of mind and the satisfaction of his patient will depend, is to what extent the canal of the uterus is involved in the inflammatory process. This will demand a careful examination of the uterus and any discharge present. Should endometritis to any extent complicate the erosion, the uterine canal should be forthwith dilated, and the endometritis treated. There is no use in temporizing with eroded states of the cervix by repeated dressings, or by applying caustics to the external os if there be an endometritic discharge left to cause irritation of a partially healed surface. It will generally be found that the most satisfactory plan is not to dally over various topical applications, but to at once proceed to dilate the cervical canal, and treat the endometrium by such applications as 20 per cent. of formalin or the liniment of iodine. If the endometritic discharge be profuse or suppurative in character a preliminary curetting will be advisable. At the same time a careful application of nitric acid should be made to the eroded surface.

This treatment should be followed by systematic dressings up to the next menstrual period, and, after it has passed over, another inspection of the uterus should be made, and any spots that remain unhealed should be redressed with the acid.

If the uterus be displaced, it is wiser not to readjust it or perform a fixation operation until the erosion be healed, and a suitable pessary can be worn without risk.

General Management.—Avoidance of exercise, interdiction of all sexual intercourse, the administration of such tonics as quinine and arsenic, mineral acids and bark.

Vaginal Douches.—Some of the following agents can be added to the water: borate of soda, boric acid, sulpho-carbolate of zinc, acetate of lead, Condyl's fluid, carbolic acid, alum, tannin (ʒss. of the borate of soda and ʒi. of one of the other agents added to a

quart of water), perchloride of mercury ($\frac{1}{5000}$), liquid extract of hydrastis, chinosol, vasol iodine, lysoform.

Other Topical Applications.—Nitrate of silver (the fused sticks before referred to, or the solution in different strengths); carbolic acid and glycerine; nitric acid; Richardson's styptic colloid; pigment of iodine and ichthyol (iodine $\mathfrak{z}\text{i.}$, rectified spirit $\mathfrak{z}\text{i.}$, ichthyol solution in glycerine 10 per cent., flexile collodion $\mathfrak{z}\text{ss.}$); chromic acid ($\mathfrak{z}\text{i.}$ — $\mathfrak{z}\text{i.}$); iodoform; perchloride of iron solution

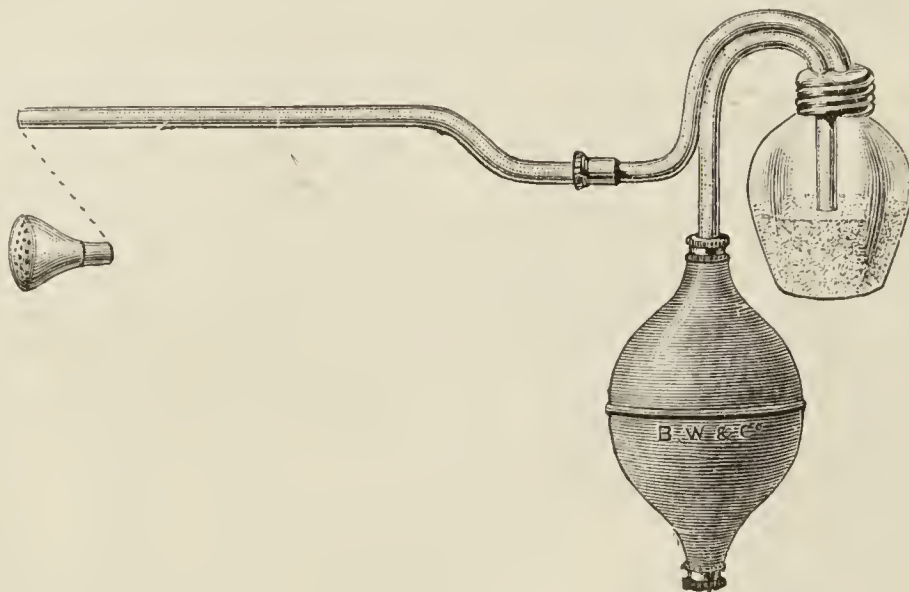


FIG. 248.—VAGINAL, UTERINE, AND OPERATING INSUFFLATOR.

($\mathfrak{z}\text{i.}$ — $\mathfrak{z}\text{i.}$ of glycerine); chloride of zinc ($\mathfrak{z}\text{i.}$ — $\mathfrak{z}\text{i.}$); liquid extract of hydrastis with glycerine; biniodide of mercury. This latter preparation is applied by first painting the eroded surface with perchloride solution, and immediately washing the surface with an iodide of potash solution, when the red deposit of iodide of mercury forms on the part.

Vaginal tampons of glycerine, borolyptol, glycothymolin, glycerine and tannin, glycerine and boric acid, glycerine and hydrastis; glycerine, hydrastis, and ichthyol; iodine and glycerine, chinosol. I do not recommend ointments of any kind.

The appliance in Fig. 248 I had made for me for blowing any powder on the cervix, inside the cervical canal, and on the surface of the wound if required. The powders "Loretin" and "Dermatol" I have found of service.

Scarification.—Much benefit may be derived by the abstraction periodically of a little blood with the uterine lancet.

Suppositories.—I do not advise vaginal suppositories. The best are those of belladonna, opium, cocaine, acetate of lead, tannic acid, oxide of zinc, and iodoform.

Follicular Degeneration.—Three pathological conditions of the

os uteri and cervix are closely allied to each other, both in their etiology and histology; these are—follicular degeneration, follicular hypertrophy, and mucous polypi. All three are sometimes associated with either a congested, eroded, or lacerated cervix, and eversion or 'ectropion' of the lips of the os uteri. Congestion and hyper-distention of the glands of the cervix (ovula Nabothi) lead to a general cystic condition, and the cysts either rupture, or through hypertrophy of the subjacent tissue are forced forwards in the form of polypi, or form, in the external vaginal surface of the os uteri, gray or yellow cystic projections, which frequently have purulent contents, but are more usually filled with colloid matter. Sometimes the collapse of the follicle is



FIG. 249.—FOLLICULAR DEGENERATION AND EROSION WITH SLIGHT LACERATION. (AUTHOR.)



FIG. 249A.—SHARPLY DEFINED EROSION WITH LACERATED CERVIX. (AUTHOR.)

followed by a depression on the surface of the cervix. This little pit slowly disappears. The contents of the cysts are granules, mucous corpuscles, and epithelial cells; they are lined by a basement membrane (Farre). If the cystic degeneration of the follicles of either one or both lips of the os should proceed unchecked, and there be an increase in the connective tissue of the cervix, a state of general hypertrophy ensues, attended at times by fungous growths. Thus 'follicular hypertrophy' (Schroeder) of the cervix commences in follicular degeneration and cyst-formation: the polypoid character of the cystic growth being, in this instance, prevented by the investing and resisting epithelium of the vaginal surface of the cervix. Mucous polypi are found rather in elderly multiparae.

Diagnosis.—The presence of the numerous small cysts, and the nature of their contents; the appearance of the characteristic polypus protruding from the os; the soft, cystic-looking, and enlarged lip, will readily distinguish the three conditions. Should a cyst rupture, and an apparent ulcer form, this softened state of the cervix might be mistaken for malignant ulceration. Such an error I have known committed in a case in which I subsequently ablated one lip of the os for cystic hypertrophy.

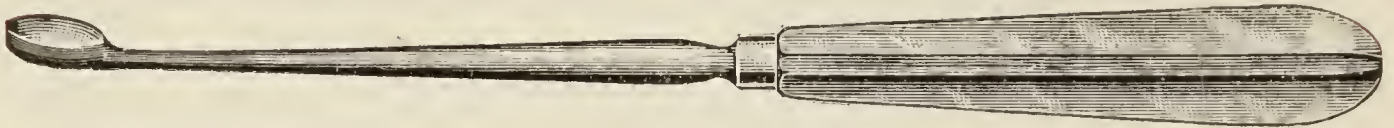


FIG. 250.—SHARP SPOON.

Treatment.—Cysts must be opened and curetted, or the contents evacuated, and chromic acid, carbolic acid, or nitric acid applied to the cavity. A mucous polypus must be removed with scissors or forceps. If we suspect the presence of small polypi inside the cervix, the canal is dilated, and resort had to the curette, forceps, or long scissors for their removal. Nitric acid or chromic acid may be used to destroy very small polypoid projections in the canal.

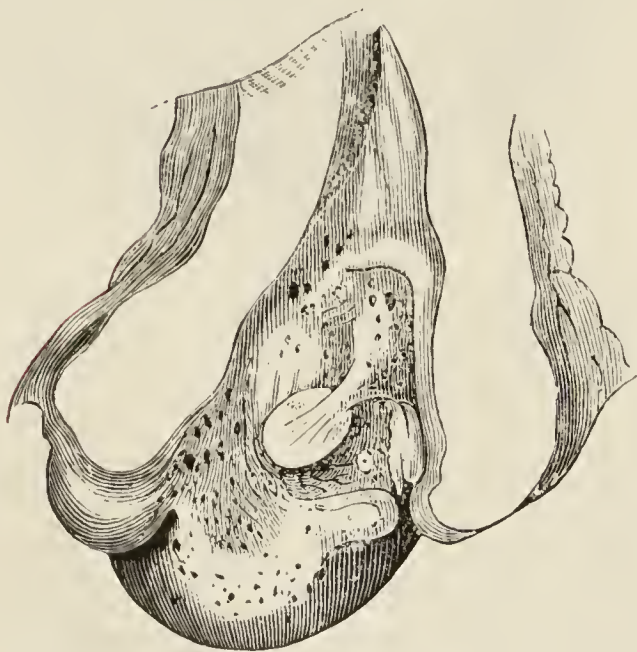


FIG. 251.—FOLLICULAR HYPERTROPHY OF THE CERVIX—SECTIONAL VIEW. (POZZI.)

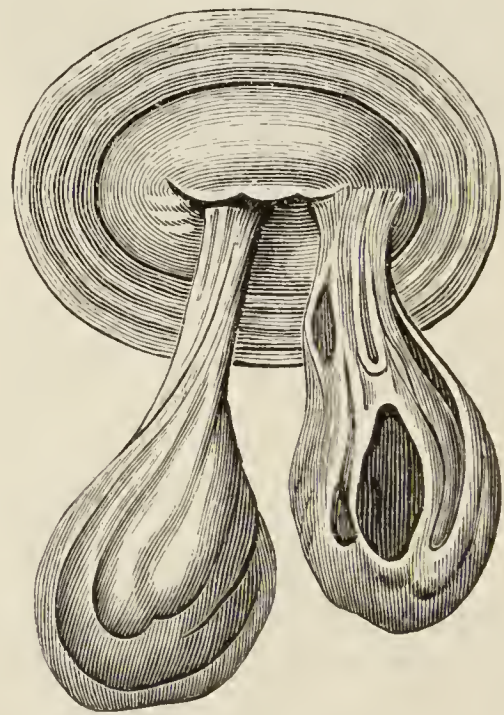


FIG. 252.—MUCOUS POLYPI GROWING FROM THE INTERIOR OF CERVIX, FOLLOWING FOLLICULAR HYPERTROPHY. (POZZI.)

In very obstinate cases of cystic degeneration and follicular hypertrophy, the diseased vaginal portion of the cervix may require ablation. (*Vide Amputation of Cervix*, p. 302.)

CHAPTER XVII.

PELVIC INFLAMMATION.

THERE are three forms of pelvic inflammation, which might well be considered in connection with each other under the heading of *Perimetric Inflammation*. These are—

1. Perimetritis.
2. Ovaritis.
3. Salpingitis.

Two of these, ovaritis and salpingitis, are placed in this work under the portions devoted to affections of the ovaries and Fallopian tubes. They can be studied in connection with other forms of pelvic inflammation.

Perimetritis.—By perimetritis we mean inflammation of the pelvic peritoneum, and limited to it.

As regards *clinical differentiation between perimetritis and parametritis*, we must abandon any theoretical distinction which, on anatomical grounds, has been drawn between these conditions. I am in full accord with Emmet and others, who declare that clinically this theoretical distinction disappears, and that it is impossible (at least in the majority of cases) 'to make any distinction at the bedside.' I believe that it is better clinically to retain the term perimetritis alone, and include under this head any secondary inflammation in the cellular tissue in the neighbourhood of the uterus. This latter may primarily occur between the layers of the broad ligaments, between the bladder and uterus, between the vagina and posterior wall of the uterus. The cellular tissue around the cervix may be the original seat of the inflammatory effusion or phlegmon, yet we frequently have salpingitis, ovaritis, and different degrees of pelvic peritonitis, with effusions in Douglas' pouch as a consequence. On the other hand, the inflammation may commence in the peritoneal folds of the pelvis, anteriorly or posteriorly, and effusion may occur primarily inside the peritoneal cavity, as it often does in the pouch of Douglas. Here cellulitis is a

secondary result of the pelvic peritonitis, and both the serous linings or folds and the cellular tissue of the pelvis are alike involved in the inflammation and resulting effusion. The secondary peritonitis may be as limited or localized in the case of the primary cellulitis, as the secondary cellulitis is in the instance of the primary peritonitis.

Hardon has drawn a distinction between true cellulitis and the fulness and hardness due to the turgescence and engorgement of the large venous sinuses in the broad ligaments consequent upon pressure and dragging of the uterus. Proper elevation of the uterus relieves this congestion. This venous engorgement points to the facility with which, in such cases, operative interference (Emmet) occasionally leads to phlebitis and septic sequences.

The relation of pelvic cellulitis to peritonitis is a matter of extreme importance. Does the cellulitis precede the peritonitis, or *vice versa*? Polk first,* from a series of observations made by him in the Bellevue Hospital, argued that peri-uterine inflammation is a product of salpingitis, that the cellulitis is secondary to the peritonitis. This is the view which was advanced in previous additions of this work. Cullingworth, in an interesting article,† declares himself in favour of Polk's view. This is the attitude of the majority of modern gynecologists to this question.

I am quite in accord with the statement that 'the inflammation in the great majority of cases begins in the mucous membrane of the uterus, either from septic absorption or the poison of gonorrhœa,' or from other infective cause, and have already urged this view in dealing with the course of metritis and endometritis. Pain is often absent in perimetritic inflammation until the peritoneum is attacked. The clinical axiom that 'neither a *clean* wound nor a *clean* sound ever produced cellulitis' (the italics are the author's), is one I thoroughly endorse, and it places in its proper light the responsibility resting on the shoulders of every practitioner who uses the uterine sound, to see that the sound itself, and the vagina of his patient, are free and clean from any infective organisms before the instrument is passed into the uterine cavity.

'Adhesive perimetritis,' says Matthews Duncan, 'is almost certainly second in point of frequency among the diseases of women, the first position being held by uterine cervical catarrh; in post-mortem examinations of women no pathological condition is more frequently discovered than adhesions between the internal genital organs and neighbouring parts, especially about the ovary.'

Any one, who, like the author, has spent a considerable number of years teaching in an anatomical theatre, and who has been engaged in making dissections of the female pelvic viscera, will

* *Transactions of the Association of American Physicians*, 1866.

† *British Medical Journal*, Dec. 27, 1890.

verify this conclusion. 'I do not exaggerate,' says Emmet, 'when I assert that pelvic cellulitis is by far the most important disease with which woman is afflicted.'

Causation.—Perimetric inflammation is constantly associated with acute metritis and endometritis; ovaritis; salpingitis; septicæmia; pyo-salpinx; arrest of menstruation (due to the effect of cold); abortion and parturition; operations on the uterus and vagina; the passage of the uterine sound; the use of tents; gonorrhœa; imperforate hymen and concealed menses; ovarian cysts; uterine fibroids; tubercle; cancer.

Micro-Organisms in Pelvic Suppurations.

Cases have been recorded by Hartmann and Morax,* showing that acute aseptic peritonitis may occur. No micro-organisms could be discovered in the sero-fibrinous fluid that was examined. The same authors† proved that cases of catarrhal salpingitis, hydro-salpingitis, retro-uterine hæmatocoele, with fever, may occur without the presence of micro-organisms. The same is true of a number of cases of suppuration of the adnexa, but in a large proportion of the latter streptococci and gonococci were found.

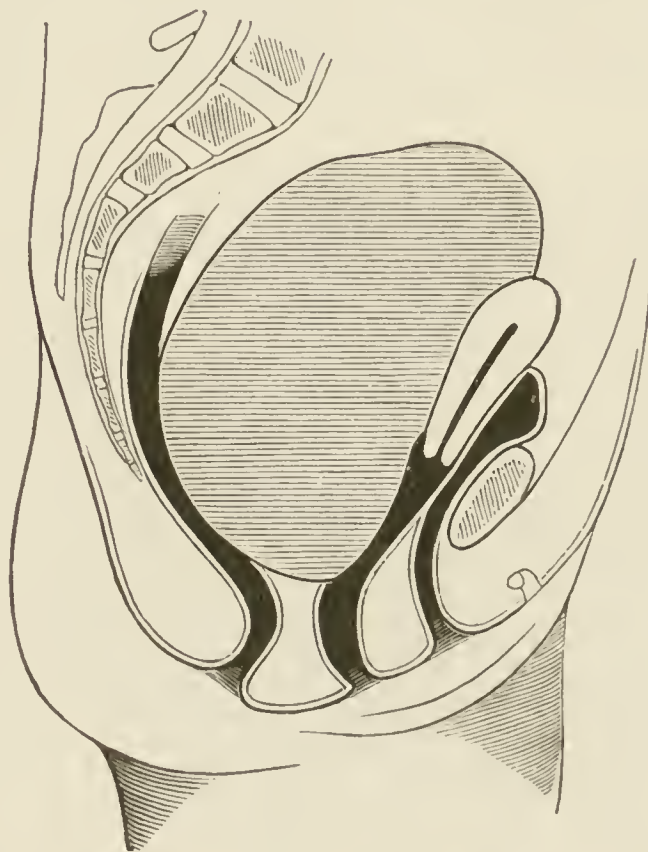


FIG. 253.—COLLECTION OF SERUM IN THE PERITONEAL CAVITY — PERIMETRITIS SEROSA. (SCHRÖDER.)

In the pus of suppurations of the adnexa are found the streptococcus pyogenes (the infective bacterium of puerperal septicæmia); the gonococcus; the bacterium coli commune; the staphylococcus aureus; the bacilli of tubercle, and the cladothrix of actinomycesis. (See chapter on Bacteriology.)

Pathology.—The division of perimetritis (Matthews Duncan) into three kinds—adhesive, serous, and purulent—answers all practical purposes. In the first variety there is an exudation of plastic lymph from the engorged and turgid peritoneal vessels. This results either in temporary adhesions between the pelvic viscera, or in permanent adhesions which remain for the lifetime

* *Annales de Gynéc.*, xli., p. 193, 1894; Schmidt's *Jahrbücher*, band 245, 1894.

† *Rev. de Chir.*, p. 343, 1894.

of the individual, causing dragging and displacement of the ovaries and Fallopian tubes, binding these down, or connecting them with each other or with the bowel. These adhesive bands or membranous layers may shut off a collection of pus or serum, forming cyst-like cavities. Such an accumulation is shown in Fig. 253.

In the serous and purulent varieties there is an exudation of serum or pus into the peritoneal cavity, which, naturally, first collects in the most dependent situation, which is Douglas' pouch, pushing upwards the coil of intestine which is contained in it when the bladder and rectum are empty. The serous fluid, as it increases in quantity and becomes harder, may press the uterus forwards against the pubes. At other times the exudation occurs at the sides of or all around the uterus, and it may rise over the fundus of the uterus above the pelvic brim into the abdominal cavity. A limited collection of serum or pus may form between coils of intestine; this, after absorption or rupture, may leave

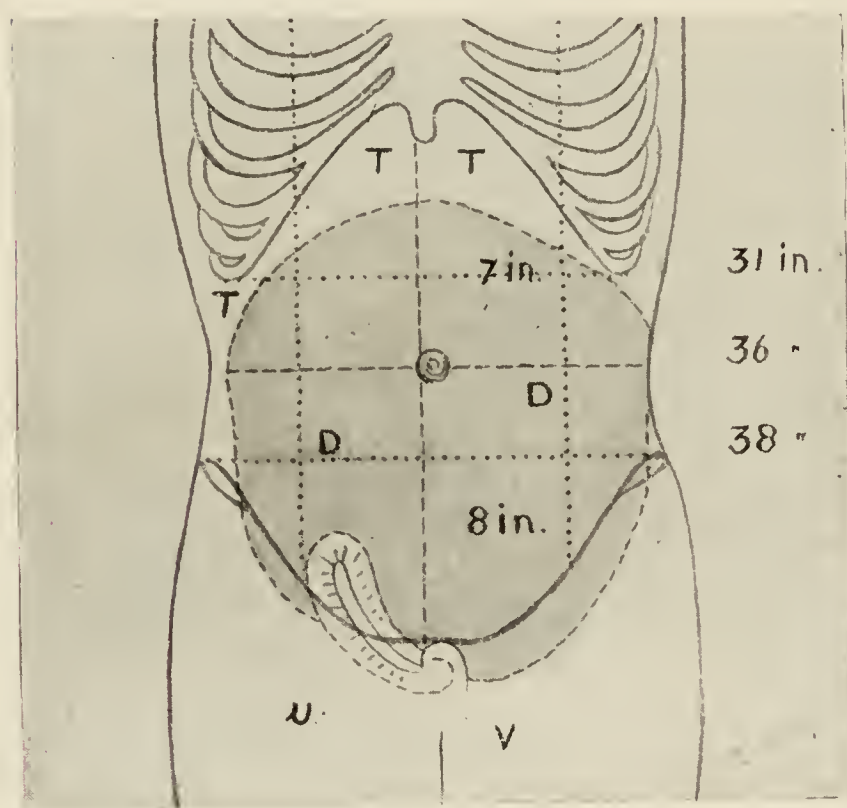


FIG. 254. (WALLACE.)

Line of incision exposing anterior layer of broad ligament, with numerous vessels distributed over it; T, T, T, tympany; D, dulness; U, uterus displaced to left, fixation partial. Cured by abdominal section and drainage.

adhesions and inflammatory thickening of the peritoneum. The quantity of pus which may collect in the peritoneal cavity is very large. I have drawn off nine pints of pus from the peritoneal cavity.

Treatment of large pelvic abscess and suppurative peritonitis by cœliotomy and free flushing out of the peritoneal cavity with an antiseptic solution is the most efficient mode of treatment of these cases of pus-accumulation.

John Wallace exemplified, by a series of cases, the advantage of the treatment of collections of fluid in the peritoneal cavity by opening and draining with antiseptic precautions. Two of his diagrams I insert to show the extent to which such fluid collections may reach and yet be cured.

If not evacuated the pus may open into the rectum, the vagina, the bladder, and (very largely) into the uterus. It may point in the groin, the upper part of the thigh, in the region of the sciatic notch, or in the lumbar region. I have seen cases which have burst into the rectum, vagina, bladder, and the groin.

A sudden escape of pus into the general peritoneal cavity is, as a rule, followed by fatal peritonitis, or septi-

cæmia. In rare instances, absorption of a large collection of fluid takes place, and a tedious and anxious convalescence follows, nor does it happen without leaving an exudation and adhesions which often resemble a circumscribed tumour in the pelvic roof.

Clinical experience teaches us that it is not right in these cases to continue an expectant plan of treatment for any length of time. There is always the risk of septic absorption, of secondary degenerations in the ovaries and tubes, and various imprisonments of fluid effusions in the broad ligaments and elsewhere, with matting together of the pelvic structures. The pelvis may be explored when it is too late, and when coeliotomy is worse than useless. This sad evidence of a policy of 'waiting on events' is unfortunately too often seen as a consequence of timidity or sanguine reliance on the *vis medicatrix naturæ*.

Symptoms and Physical Signs.—The symptoms will depend on the nature of the inflammation, whether it be acute or chronic. In acute pelvic peritonitis there are generally rigors, high temperature, rapid pulse, coated tongue, some gastric disturbance, and vomiting. The symptoms are accompanied by abdominal pain, tenderness, and tympanites. On examination the abdomen is found very sensitive

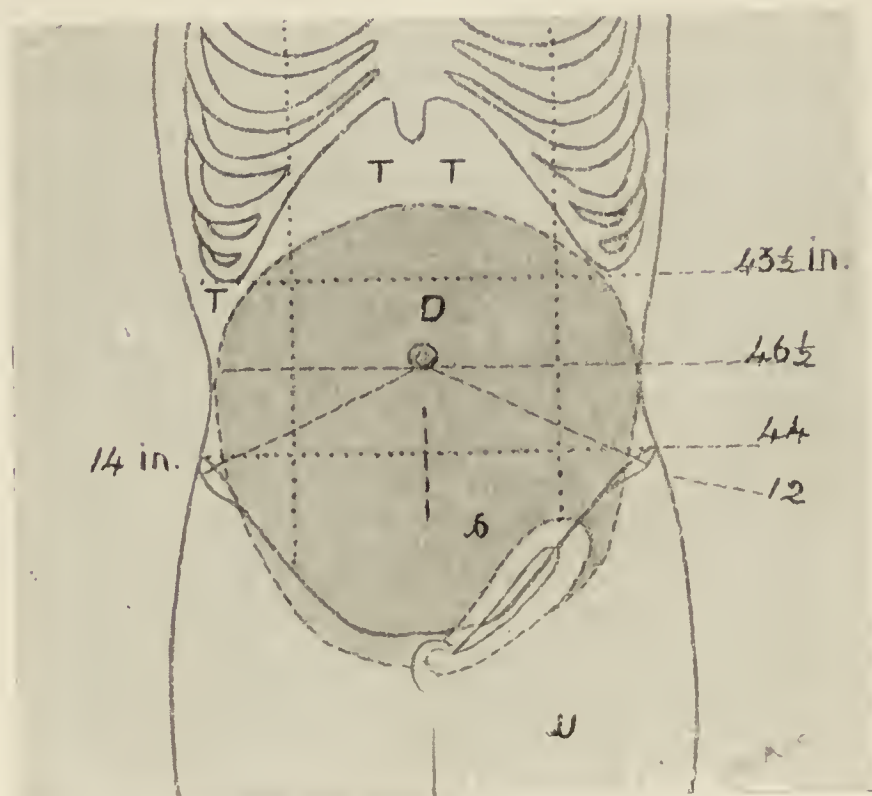


FIG. 251A. (WALLACE.)

D, dull area of tumour; T, T, tympany; U, uterus displaced downwards and to right behind tumour; V, fixed with tumour to pelvic walls. Cured by abdominal section and drainage.

to pressure; the vagina is hot, perhaps swollen, and we may, comparatively early in the attack, be able to define a fluctuating swelling in the posterior vaginal cul-de-sac, or laterally through the vaginal roof. These signs of the affection are soon followed by the characteristic one of *fixation of the uterus*. There is a hard 'board-like' feeling (Doherty) anteriorly or posteriorly, the effusion displacing the uterus, or encircling it. This may rise to the level of the umbilicus, and there may be but little fluid pus in the pelvic cavity, which is filled with a sloughing mass of phlegmonous exudation. Should the disease run an unfavourable course, the symptoms of septicæmia or general peritonitis set in; the vomiting increases; the temperature rises to 105° or 106° ; the pulse is rapid and wiry; the countenance becomes more anxious; abdominal pain, tenderness, and tympanites increase, and delirium sets in. In other instances the perimetritis is far more insidious in its onset, and the symptoms are so obscure that no local examination is made until the exudation is discovered, filling Douglas's space and fixing the uterus. Persistent abdominal pain varying in severity, or some pelvic distress either in the bladder or rectum, first calls for an examination, and the swelling is discovered. Such cases may run on for some time before advice is taken, often as much for the loss of appetite and wasting as for the local distress. A case is assumed to be one of threatening typhoid, or some 'gastric' disturbance with hyperpyrexia, and is treated accordingly, until the more pronounced local symptoms and signs arouse suspicion, attention, and examination.

Appendicitis.*—The association of appendicitis with affections of the internal genitalia has been fully discussed. In the onset of the inflammation an attack of appendicitis is liable to be mistaken for pelvic peritonitis or *vice versâ*. There is some excuse for this in the severe pain which is complained of low down in the iliac region, and the rise of temperature. The sickness, the intense inguinal pain, the sensitiveness and swelling in this region, the constipation, the early tendency to tympanites, the greater general distress, the history of previous attacks, and the negative evidence afforded by a vaginal and rectal examination, the chance of such an error being remembered, should not leave any doubt as to the presence of the bowel complication. I cannot refrain here from urging the gravest need for caution in arriving at early diagnosis of these cases of appendicitis and typhlitis, or perityphlitis. I have

* See p. 41; also chapters on Salpingitis, Pyo-salpinx, and Myomata for appendical complications.

seen some most regrettable and fatal errors made in this respect. In some cases the symptoms of appendicitis, obscure at first, run on very rapidly after some forty-eight hours, and operative assistance may thus be deferred until it is too late. Of all the acute inflammations occurring in the abdomen or pelvis, that which involves the greatest responsibility, if an expectant or temporizing attitude be assumed, is appendicitis.

A practical and clinical division of appendicitis is that of James Swayn, who divided appendicitis into simple, plastic, suppurative, and relapsing. He makes with reference to the last these important remarks:

‘The next variety—that of rapidly perforative or fulminant appendicitis—is more common in young people, and is the most fatal of any form. Its seriousness is shown by the fact that in at least 75 per cent. of perforative cases it was the *first* attack which was accompanied by the perforation. The strangulation of the appendix in the way already explained

is most complete, and rapidly runs on to gangrene of its walls, which then become perforated, with the rapid diffusion of the septic contents over the peritoneal cavity. Perforation does not usually occur until the second or third day, being preceded by the general and local pains and vomiting, as in other varieties. The temperature is not at first much raised. With the onset of

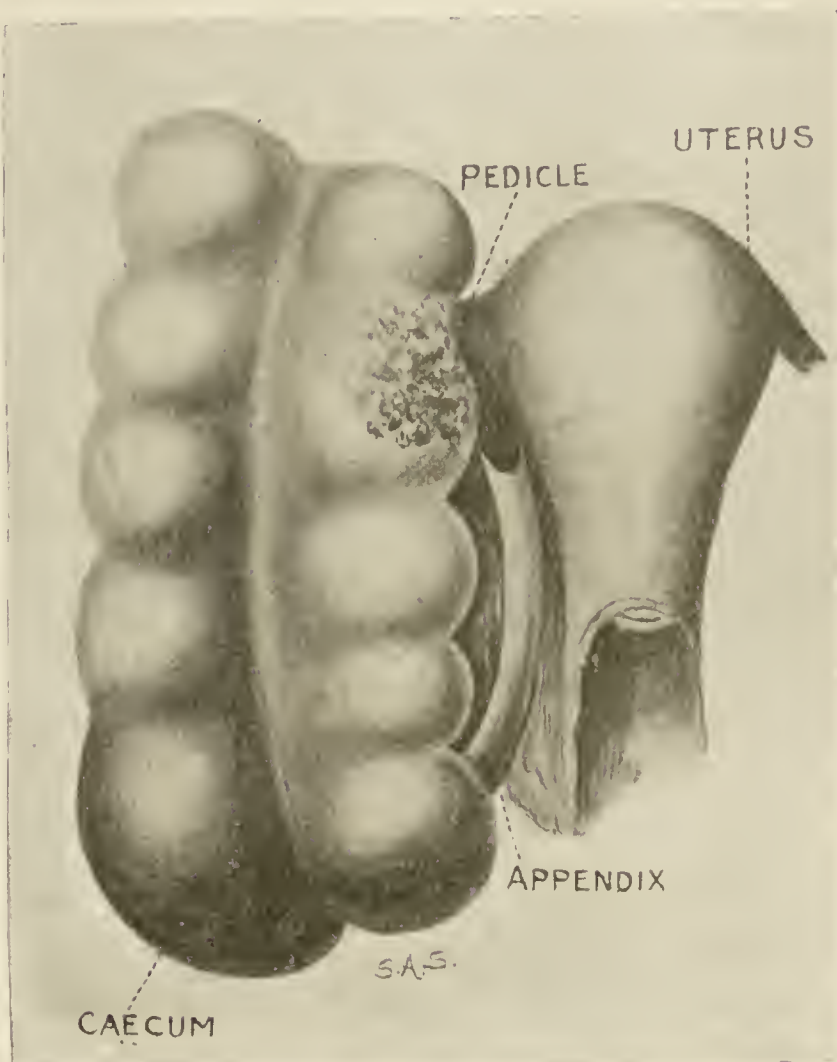


FIG. 255.—SHOWING ADHESION OF OLD PEDICLE OF REMOVED ADNEXA ADHERENT TO CAECUM AND APPENDIX. (A. SMITH.)

The above drawing is taken from a case of Albert Smith's. The right adnexa were removed, but pain still continued. Coeliotomy was again performed eight months subsequently, when the adherent caecum was separated from the pedicle, and the left adnexa removed. Symptoms still continuing, six months after the second operation coeliotomy revealed the condition as shown in the drawing—a turgid vermiform appendix, and an ulcerating cavity formed by the end of the old pedicle, the caecum, and the vermiform appendix. The ulceration was of a tubercular nature. Removal of the appendix and all the ulcerating surface, together with the remains of the old stump, effected a complete and permanent cure.

perforation the symptoms assume all the gravity of an acute general peritonitis. The pain, especially in the right iliac fossa, is more intense, and rapidly spreads over the whole abdomen, the vomiting becomes incessant, constipation is practically absolute, and the pulse is small and frequent. The general symptoms are at first those of shock, and the temperature may be low, although it subsequently rises to 102° or more if the patient should live for any length of time. The abdomen is at first retracted, and the abdominal muscles very tense, but later on there may be general abdominal distension from paralysis of the intestines. The face bears the usual anxious expression of acute abdominal disease. The patient may die in a day or two, apparently from a general septic condition, before much suppuration has occurred; in some cases she may drag on for a fortnight or more, but eventually she dies of a general suppurative peritonitis. According to Fitz,* 98 out of 176 cases died in the first week.'

Prognosis.—Perimetritis is always a dangerous and serious affection. The principal dangers are: general peritonitis, phlegmon of the pelvic cellular tissue, pelvic abscess and septicæmia, metritis, uterine displacements, and, as secondary results, limited organized effusion, adhesion, atrophic states of the ovaries, obliteration of the tubes, dysmenorrhœa, and sterility.

Treatment.—The immediate steps to be taken in a case of pelvic inflammation will entirely depend on the cause of the affection and the complications that are met with. In the acute stage it will depend on the course the inflammation has followed and the pelvic developments: opium in grain doses; an ice-bag on the abdomen; the application of Leiter's temperature-regulators; leeches to the hypogastrium; enemata; relief of the bladder by the catheter, if necessary.

In chronic cases, avoidance of chills and exposure to cold; great care at the menstrual periods; rest in bed should there be periodical exacerbations of temperature and swellings; sexual intercourse should be prohibited. Resort may be had to warm hip and iodine baths, applications of iodine externally (iodine pigment, made of iodine, $\zeta i.$, mastich $\zeta i.$, rect. spt. $\zeta i.$), warm compresses, the hot vaginal douche, with laudanum added to the water. A few leeches, when the patient is threatened with recurrence of attacks, may be applied near the anus or in the vaginal region. The bromides, with iodide of potassium, are indicated; and, if sickness occur, such medicines as oxalate of cerium, bismuth, hydrocyanic acid, chloride of calcium, or effervescing mixtures of bicarbonate of soda and potash, may be given. Dry champagne, or small doses of brandy, with soda or seltzer water, are perhaps the best stimulants to select. These should be given in very moderate quantities, and abandoned when the occasion for their employment has passed.

* *Am. J. M. Sc.*, vol. xxii., 1886, p. 321.

To Säger* we are indebted for the following comprehensive classification of all operative procedures:—

1. Operations through the vagina.
 - (a) Anterior colpocœliotomy.
 - (b) Posterior colpocœliotomy.
 - (c) Anterior and posterior colpocœliotomy combined with uni- or bilateral salpingo-oöphorectomy.
 - (d) Colpohysterectomy.
 - (e) Colpo-hystero-salpingo-oöphorectomy, 'radical operation through the vagina.' †
2. Abdominal operations.
 - (a) Uni- or bilateral cœlio-salpingectomy and cœlio-salpingo-oöphorectomy.
 - (b) Total cœlio-salpingo-oöphoro-hysterectomy (radical abdominal operation).
 - (c) Bilateral cœlio-salpingo-oöphorectomy combined with supra-vaginal hysterectomy.
3. Abdomino-vaginal hystero-salpingo-oöphorectomy, commenced generally through the vagina, and ending by abdominal section.
4. Sacral or parasacral cœliotomy. This operation we need hardly consider.

Bouilly urges that in acute pelvic abscess and primitive peritoneal connections, as also in encysted abscess of the appendages, incision, followed by drainage, frequently cures, and that vaginal puncture does not interfere with the subsequent hysterectomy, if such a step be demanded. The unilateral or bilateral character of the adhesions, the height in the pelvis to which the purulent collection extends, the degree of adhesion of a suppurating sac to the uterus, must be the principal guides to the choice of one of the two steps, cœliotomy or vaginal hysterectomy. The latter operation, he says, has the advantage of being more radical in character, and provides more perfect drainage, while the utero-adnexal castration affords the most complete protection against any associated subsequent complications.

This conclusion of Bouilly's must be accepted as applying generally to pelvic suppurative conditions. In certain cases the abdominal route is, in my opinion on many grounds, that by which we can operate most safely, thoroughly, and expeditiously. The local conditions and complications in the individual case under consideration will guide the surgeon in his choice of route. Only a most exhaustive examination under anæsthesia can determine what these conditions are.

* *Geneva Medical Congress, Proceedings*, 1896.

† **Removal of the Uterus in Pelvic Suppuration.**—From the persistence of the gonococcus infection in the uterus, the continuance of menstruation, the possible though improbable occurrence of cancer in the uterus, the advantages through drainage of the operation itself, and the absence of any sexual effect, Matthew Mann advocates the removal of the uterus with the adnexa in cases of salpingo-oöphorectomy for pelvic suppuration. Noble is also a warm advocate for hystero-salpingo-oöphorectomy. (*Amer. Gyn.*, July, 1903.)

‘Where,’ says Kelly, ‘the ovaries are seriously involved in the disease, converted into abscess sacs or large hæmatomata, or if they be densely and intimately matted with the inflamed tubes, so that it is useless to attempt to save them, the removal of all the diseased organs, together with the uterus, is demanded. The tube and ovary on the least adherent side are first freed, the broad ligament is tied off, the bladder pushed down, and the uterine arteries secured. The cervix is cut across, and the opposite uterine vessels on the more difficult side are exposed and ligated. Finally, the round ligament of that side is caught and divided. The remaining tube and ovary may now be enucleated by peeling them out from below upwards with the fingers, and then completing the enucleation, or if the adnexa on the difficult side are densely adherent and very difficult to enucleate, the uterus is clamped at its cornu and removed with one tube and ovary, when, the pelvis being thus emptied, more room is obtained to deal with the remaining embedded adnexa.

In more difficult cases still, complicated by pelvic abscesses and general adhesions, while the uterus itself is buried in a mass of these

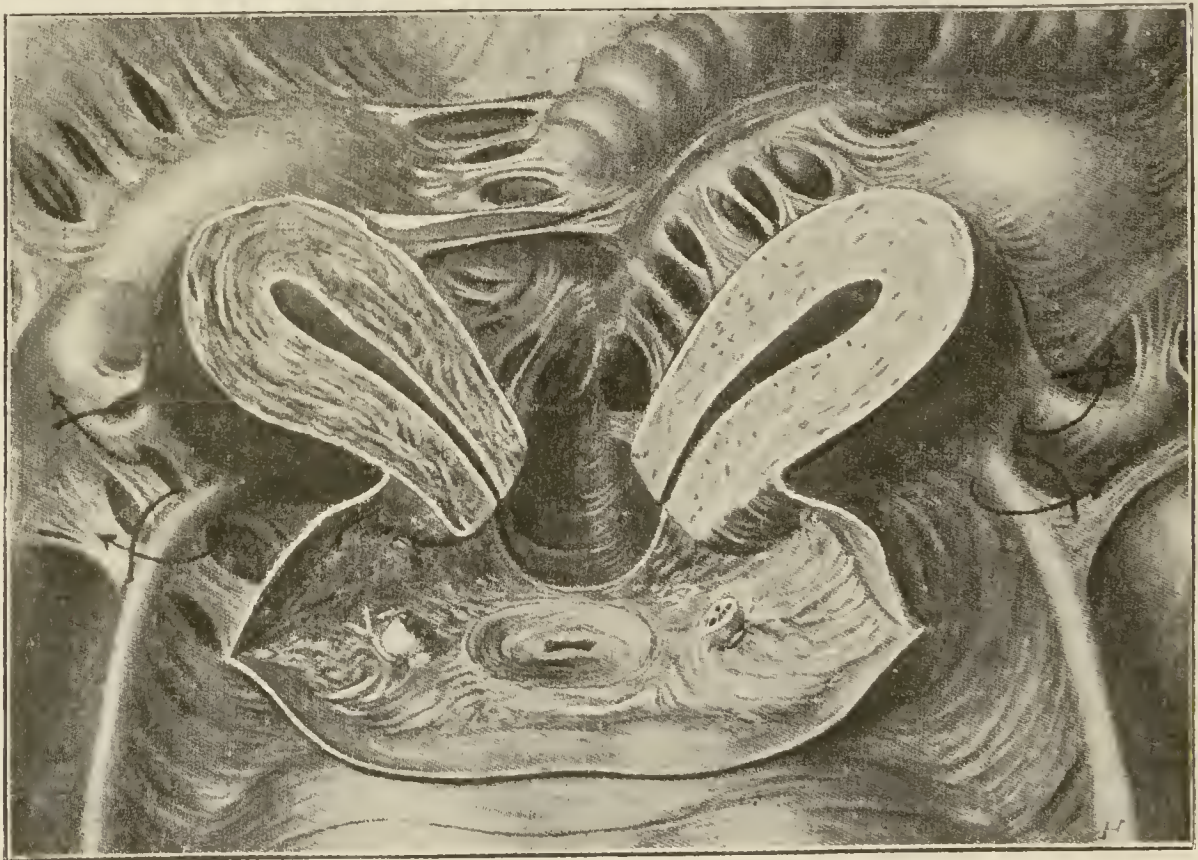


FIG. 256.—KELLY'S OPERATION FOR OOPHORO-SALPINGO HYSTERECTOMY IN CASES OF EXTENSIVE ADHESIONS AND SERIOUS ADNEXAL COMPLICATIONS.

The uterus is bisected and amputated at the cervix, and the tubo-ovarian vessels and the round ligaments are ligated.

latter, the steps of the operation are as follows:—The bladder and rectum are carefully separated, and any abscesses, cysts, or

hæmatomata aspirated or punctured, after which the abdominal cavity is packed off from the pelvis. The next step is the incision of the uterus in the middle line antro-posteriorly, at the same time that the cornua are pulled up and drawn apart. By the aid of Museau forceps, and lateral traction on the uterus, either half is everted and the bisection is carried down, stopping short either at the cervix or vagina according as a supravaginal or pan-hysterectomy operation is determined on. If the former, the cervix is divided on one side, after which the uterine vessels are secured, then the round ligament, and finally the tubo-ovarian. Thus one half of the uterus is removed. The opposite side is dealt with in the same manner, or clamps may be temporarily applied. Free space is now left for careful dissection and enucleation of both adnexa, should these not have been

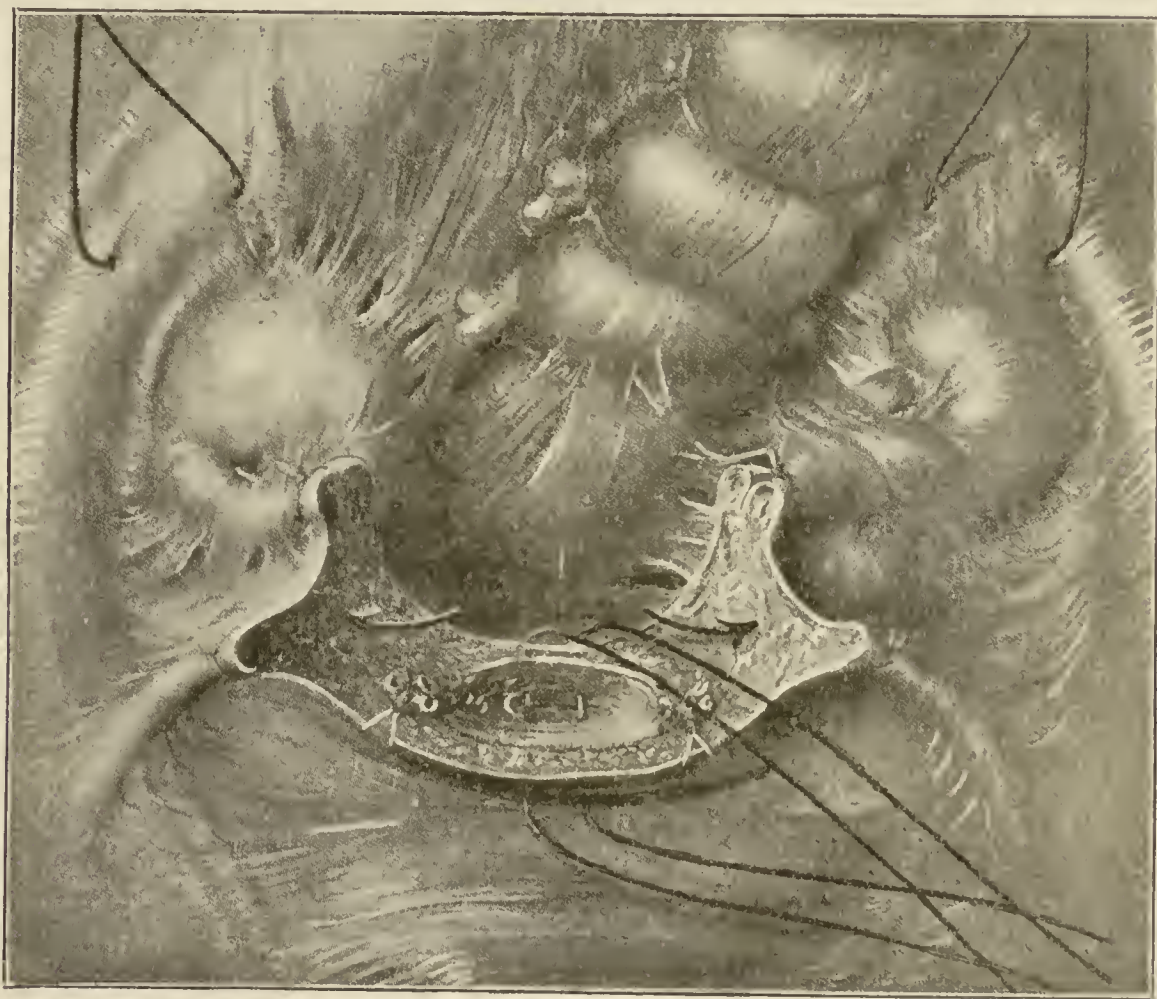


FIG. 256A.—UTERUS REMOVED—THE VESSELS LIGATED—BURIED SUTURES PASSED TO UNITE THE PERITONEUM OVER THE CERVICAL STUMP. (HOWARD KELLY.)

removed with the uterine halves. If pan-hysterectomy be the operation chosen, the bisection is carried well into the vagina. The cervix must be very cautiously severed with moderated traction on the uterus. If the bladder be pushed down while the divided cervix is pulled apart, the bisection may be continued behind the vesico-uterine fold, or, the peritoneum having been

incised from side to side, the cervix is bared by pushing it down in the usual manner. Should the rectum be completely adherent behind to the uterus, the anterior face of the latter is bisected, the cervix divided horizontally, the uterine vessels caught, and a careful division of the posterior wall of the uterus then made from below up, a piece of uterine tissue being left adherent to the rectum rather than endanger the bowel by tearing.

Puncture through the Vagina.

Howard Kelly urges the low mortality of the treatment by puncture through the vagina, and the freedom from the dangers and risks inseparable from the major operations. His dictum, however, that '*in young married or unmarried women, in the case of girls who have not come to maturity, even seriously diseased organs should not be removed, until every other means of cure has failed,*' must be accepted with considerable reserve. To wait until all the other resources of medicine and surgery have been tried before proceeding to remove a '*seriously diseased*' organ, is to undertake a responsibility few modern surgeons would care to accept.

As I have already emphasized, no possible precaution must be overlooked both before, during, and after an exploratory or evacuation operation, regarding asepsis of the vagina.

The rectum, bladder, uterine arteries and ureters, have to be carefully avoided. Should the peritoneum not have been opened, the abscess cavity is irrigated with sterilized chloride of sodium, or weak formalin solution. The cavity is wiped clean with mops of sterilized iodoform gauze, and then drained with iodoform gauze or a soft sterilized tube.

In pyosalpinx I lean to the side of cœlio-salpingo-oöphorectomy, and, if the uterus be at the same time seriously involved, I have no hesitation in saying that I regard the operation of cœlio-hystero-salpingo-oöphorectomy as the classical one. Here the uterus and adnexa are removed. The operation often involves the greatest difficulty in consequence of adhesions and the septic state of the organs. Therefore, it is one in which no desire for speed can excuse incomplete asepsis and hæmostasis, abdominal and vaginal; the careful adjustment of the peritoneal edges and the provision for vaginal drainage. The operation is completely described in the chapter on hysterectomy.

On the question of drainage, Säger gave the following indications for its indispensable employment:—

(a) Every time that virulent pus has contaminated the operator's hand or the unimpaired part of the abdomen.

(b) Every time that the hæmostasis is not perfect, especially when there is a discharge of virulent pus.

(c) In the case of the existence of a fistula before the operation, or of perforation of the intestine happening during the operation, or likely to happen afterwards. Every time also when fistulæ or perforations have been closed by the suture.

Sänger lays down the rule that coeliotomy is always indicated in large purulent collections and in suppurative cystic neoplasms, and the concert of opinion of German gynæcologists is distinctly in favour of ablation of all suppurated organs. This is the practice of A. Martin, the Landaus, and Schauta. The vaginal operation has gradually superseded the abdominal route in most of the Continental clinics. A divergence of opinion, however, still exists as between the radical operation through the vagina, and abdominal salpingo-oöphorectomy or hysterio-salpingo-oöphorectomy. After contrasting the vaginal and abdominal operations, Sängcr makes these remarks:—

‘The vaginal operation, perhaps less radical than the abdominal, is, however, infinitely simpler and far less dangerous in its execution; it must be considered as the one to be selected.

‘Every time that preservation is not indicated, the supra-vaginal cœlio-salpingo-oöphoro-hysterectomy will be the least dangerous radical operation.

‘It can even be performed while preserving parts of the ovaries.’

In considering the cases in which a radical operation is indispensable, he himself prefers the abdominal method, and finally concludes:—

‘Advocates of the different operative methods should avoid claiming an absolute superiority for their own proceeding. Various methods may be justified, and in each individual case it is far better to take into serious consideration the special advantages offered by each one of the methods.’

Leopold, in advocating hysterio-salpingo-oöphorectomy in chronic suppurative conditions of the adnexa, with associated diseased states of the uterus, refers to the conditions that indicate this radical step:—

(a) Where the patient is deprived of all enjoyment of life and capacity for work. (b) Where all ordinary and extraordinary therapeutic measures have failed. (c) When the pathological conditions include such states as the following: A retroflexed and adherent uterus, enlarged by chronic metritis and endometritis. Muco-purulent discharge from the uterus, or possibly periodical severe metrorrhagia. Salpingitis and pyo-salpinx, and diseased conditions of the ovaries. Such states are easily determined by a thorough examination.

Leopold thus enumerates the advantages of total extirpation by the vagina:—(1) The complete removal of the diseased organs, without leaving behind a still inflamed uterus as a focus of further mischief. (2) The wound is at the lowest part of the abdominal cavity, favouring drainage. (3) The operation field is readily accessible, even in non-parous women, and in cases of large swellings of the appendages. (4) There is no abdominal wound, and the risk of ventral hernia is obviated. (5) The operation is much less dangerous than laparotomy; the intestines do not come into view; the soiling of intestines with pus is prevented, the operation is practically

extra-peritoneal, and, lastly, it is available for patients in such a weak condition that laparotomy would almost certainly prove fatal.

Peri-uterine Phlegmon (Parametritis).

For clinical reasons rather than on strict pathological grounds, I still consider under a separate head the condition here described as 'uterine phlegmon.' By the term 'parametritis' we mean a phlegmonous inflammation of the connective tissue of the pelvis.

Causation.—It occurs often in association with the puerperal states as the result of septic absorption. The proportion of cases of peri-uterine inflammation due to child-bearing, miscarriage, abortion, both criminal and other, is understood if we place these affections as furnishing over 50 per cent. of the causes.

It may also be due to traumatic causes, as operations on the uterus; the use of tents, intra-uterine stems, and medication; it may be a sequel to hysterectomy, and attend as a complication of ovaritis and salpingitis.

Pathological Anatomy.—The extensive distribution and connections of the cellular tissue of the pelvis explain the different positions in which the exudation occurs in parametritis. This may be in the layers of the broad ligaments behind the uterus and rectum, or extend upwards along the psoas muscle to the kidney or into the iliac fossa, and occasionally occur between the rectum and uterus, the uterus and bladder, and downwards into the cellular tissue of the gluteal region by the sciatic notch. The adnexa are necessarily involved.

The stages of the inflammation are the same as those of phlegmon occurring elsewhere—(a) congestion, (b) effusion, and (should resolution not occur) (c) suppuration. The inflammation may not pass beyond the second stage. With regard to the exudation, there are many degrees of intensity, from a slight swelling in either broad ligament to a considerable infiltration at both sides or in front of the uterus, leaving a hard mass that fills the entire upper part of the pelvis. The uterus is pushed to either side, out of position, or pressed downwards, forwards, or backwards. The effusion at first feels doughy to the finger; it then gradually hardens, and if an abscess form, it again softens, and fluctuation may be detected. Though the uterus is at first pushed to the opposite side, later on, when absorption has begun, it is *drawn to the side of the exudation* (Schroeder). This ultimate traction of the uterus to the side of the pelvis in which an old effusion has healed has an important bearing

on diagnosis. It also explains the pain which is specially complained of in the contracted region through adhesion of the broad ligament or ovary of that side, and displacements and entanglements of the tubes, or compression of the ovary, especially at the left side, by the laterally drawn uterus against the rectum or pelvic wall. And the bilateral character of the pain is caused by the tension of the broad ligament of the opposite side, and the dragging of the ovary and possible stretching or torsion of the Fallopian tube. These are generally sad cases, for they are difficult to alleviate or remedy.

Diagnosis.—The most reliable points of distinction between perimetritis and simple phlegmon are set down in tabular form, and will help to differentiate these effusions from other swellings liable to be mistaken for them (p. 377). Easy though it may seem to the experienced hand, it is not at all so simple a matter for the young practitioner to diagnose some chronic peri-uterine exudations, especially those situated anteriorly or posteriorly, from fibroid tumours of the uterus. This arises when the tumour cannot be moved apart from the uterus, so that it is difficult to isolate it.

Symptoms and Physical Signs.—Acute phlegmonous inflammation is marked by the following symptoms: rigors, increase of temperature (102° – 104°), rapid pulse, pain in the hypogastrium, general febrile disturbance, rectal discomfort and constipation; the vagina during this stage is found to be hot and swollen, and there may be vaginal pulsation. Later on careful vaginal and rectal exploration will enable the examiner to detect, in some portion of the vaginal roof, or posteriorly in the utero-rectal space, a painful swelling, the commencement of exudation.

Quite recently I was myself deceived in a case of this kind. The patient had been treated for uterine displacement by a distinguished gynaecologist abroad, and within the same year by a London obstetrician for the same condition. Shortly before I saw her an eminent London gynaecologist pronounced the case to be one of uterine myoma; another, that of an inoperable malignant tumour. I considered it to be one of myoma, possibly degenerating. Operation proved it to be one of pelvic perimetritic exudation, with pyo-salpinx and extensive adhesions.

Later still, the 'board-like' feeling of the induration and the displacement of the uterus and its fixed position leave little room for doubt. The decubitus is more frequently to the affected side. There is a very characteristic symptom which occurs also in perimetritis—that is, retraction of the thigh. This happens when the

iliac or psoas muscles are involved, and an abscess has formed, or is forming, in the neighbourhood of, or involving, the psoas muscle.

But perhaps the most vital fact for the practitioner to remember is the essentially chronic and insidious nature of the affection in many instances. It is not necessary that the patient should complain of any marked symptom which would attract the medical man's attention specially to the uterus or the pelvic genital organs. I have seen such cases where pelvic mischief was not even suspected. I had such a case, in which dysenteric symptoms completely masked those of cellulitis, and absorbed the attention of the physician. There had been, in the first instance, endometritis. The patient was unmarried. When I saw her, the uterus was quite fixed by an exudation, which surrounded it and pressed it back against the rectum, so that it occluded the cul-de-sac of Douglas ; this explained the rectal distress.

Pain in walking, a throbbing sensation in the uterus, general loss of health, some nightly rise of temperature or hectic, may be the only symptoms present in these chronic cases. Following on either the acute attack or the chronic form, there is gradual wasting and loss of weight, and, in some instances, emaciation. The patient is worn down by the suffering and the local distress. If the exudation should terminate in suppuration, and an abscess form, relief may rapidly be afforded through its bursting or the evacuation of the pus. Unfortunately, it occasionally happens that the pointing of the abscess is a matter of long duration ; the pus burrows in the cellular tissue, and long sinuous channels form, through which it finds its way to the surface, and these render the case extremely protracted. Such a disastrous series of complications should not be permitted to occur, in the face of our present knowledge, by any surgeon.

The exudation may harden, and a solid tumour occupy some portion of the pelvis, producing both rectal and bladder distress by pressure on these viscera, and exhausting the patient through a slow process of absorption, prolonged over many months of unrest and suffering. If an abscess form, it may point in the rectum, bladder, vagina, or abdominal wall.

In addition to the immediate dangers, from the inflammation involving the peritoneum and causing general peritonitis, or the more remote risks that are inseparable from the presence of pus and the bursting of a pelvic abscess, there are the ultimate results, such as adhesions, atrophy of the ovary, occlusion of the Fallopian

tube, sterility, uterine displacements, with amenorrhœa and dysmenorrhœa. It is not an affection in which we have so much to fear fatal consequences as these chronic pathological and clinical sequelæ.

Treatment.—Most of what has been said regarding the treatment of perimetritis refers with equal force to peri-uterine phlegmon; we must advise rest in every way that it can be secured, and that for a considerable time; opium in the acute stages, and the regulation of the temperature by the application of ice, or Leiter's irrigator, which can be applied both externally and in the vagina. The hot vaginal douche, with a disinfectant in the water, used three or four times daily, and hot compresses or thin cataplasms applied externally and covered with oiled silk or protective, are beneficial. Light vesication over the epigastrium is useful. The patient's strength must be sustained with a light and nutritious diet. In the chronic stages the iodides of potassium, strontium, or sodium, combined with bromides and tonics, may be given. In these cases of old and unabsorbed effusion, the patient should be placed on a course of perchloride of mercury and bark, or a pill containing percyanide of mercury (gr. $\frac{1}{12}$), quinine (gr. ii.), extract of gentian and bread-crumbs (q.s.); one pill three times daily. If we except the plan of Apostoli of treating parametritis by electrolysis, nothing of material importance has been lately added to our methods of treating the earlier stages of this affection, and the general principles advocated in the text are those by which we must be guided.

The various operative procedures that have been referred to in treating pelvic suppurations are those to be adopted in suppurating pelvic phlegmon. Among the more important therapeutical means are—

The free use of the hot douche, to favour resolution and promote absorption.

Quinine, antipyrin, antifebrin, and phenacetin as antipyretics, in the acute stage.

Careful curetting of the uterus, after dilatation, with antiseptic drainage, if there be endometritis, in the chronic stage of the disease.

The internal administration of perchloride of mercury; the value of this treatment was illustrated in previous editions of this work.

The early evacuation of any serous fluid by the aspirator, avoiding pulsating vessels and taking careful antiseptic precautions.

Early evacuation of the pus by the branched uterine dilator. If this be present in quantity, and there be multiple pus cavities, the wound has to be enlarged and the finger introduced to break down the septa.

Apostoli's treatment by electrolysis (*vide* remarks on Gynæcological Electro-Therapeutics).

I must say a word of caution regarding the rectum. I could cite cases in which both serious consequences to the patient, and unfortunate errors of diagnosis, have resulted from overlooking concretions in the large intestine and rectum when there were perimetritic exudations also present. *Explore the rectum and carefully palpate the colon in every case where a doubt exists as to the nature of an obscure abdominal swelling.*

Hot-air Treatment.—Scott Carmichael,* in A. Martin's klinik at Griefswald, watched the course of twenty-six cases of parametritis, paying special attention to the temperature and the leucocyte count as a means of diagnosis of suppuration. Martin has this estimation of the leucocytes made regularly before there is any interference, regarding it as the most certain evidence of the presence of an abscess. The uncertainty of the temperature indication makes this test of the more value. Should the number of leucocytes increase to some 20,000 per c.m., it is an indication for surgical interference. The treatment adopted in Martin's klinik consists in the bringing about of an active hyperæmia by means of hot air, which Bier † advocates as alleviating pain, promoting absorption, loosening adhesions, stimulating general nutrition and regenerating processes, as well as having a bactericidal action; also, in recent cases the effect of the hot air tends towards the development of suppuration, and in the more chronic ones to bring about absorption.

The mode of applying the hot-air treatment is as follows :—

'The patient is placed in an apparatus having the shape of a large box with two openings at the lower end, through which the thighs pass, and a large opening at the upper end for the lower part of the trunk. The body is thus enclosed from the margins of the ribs above to the knee-joints below; thus the entire abdomen and pelvis are submitted to the action of the hot air. Gas or a spirit lamp is used to provide the heat, and the temperature is controlled by means of a thermometer inserted through the roof of the apparatus. The sitting lasts for half an hour, the temperature having by this time reached from 120° to 150° C. A bath speculum may be introduced into the vagina, and the patient is covered with a loose nightdress, which can be readily drawn up. The first sittings are not taken at a temperature beyond 100° to 110° C. Before the patient is taken from the bath the temperature is allowed to cool down gradually. While in the bath the patient perspires freely. The method is simply the local application of the hot air or Turkish bath to the abdomen and pelvis.'

In the differentiation of pelvic tumours or effusions, the following table will be found useful :—

* *Jour. Obstet. and Gyn. Brit. Emp.*, Sept., 1903.

† *Therapie der Gegenwart*, Feb., 1902; *Hyperæmie als Heilmittel*, Leipzig, 1903.

PELVIC PHLEGMON.	PERIMETRITIS.	PELVIC HÆMORRHAGE.	FIBROUS TUMOURS.
Connected more frequently with abortion; parturition; operations on the uterus; septic causes.	Coming from similar causes; also often from imprudence during menstruation; from ovaritis and escape of fluid into the peritoneal cavity; gonorrhoea is a frequent cause.	Caused by some irregularity of menstruation; traumatic causes; atresic conditions of uterus, vagina, or vulva. Most frequent cause ectopic gestation.	The characteristic, slow, and more uniform growth, and the history of local pelvic distress.
Acute febrile symptoms—may be slight and unnoticed.	Acute febrile symptoms more severe; nausea, vomiting, tenderness, tympanites, more likely to be present.	Sudden appearance; usual signs of hæmorrhage; occurs without preceding symptoms of inflammation. Symptoms of peritonitis follow.	Febrile symptoms absent. History of menorrhagia and metrorrhagia.
Early hardness is more likely to be lateral.	Early hardness felt posteriorly or anteriorly.	Hardness may be felt in either cul-de-sac displacing the uterus, more generally in Douglas' space.	Distinctly uterine.
Swelling easily reached from the vagina; soft and doughy at first, then becoming hard; softening again if pus should form.	Swelling more frequently retro-uterine; if lateral, likely to be out of reach of the finger.	Swelling more frequently found in the posterior cul-de-sac or in Douglas' space. Soft at first, gradually hardening.	Swelling incorporated with the uterus, and moving with it; tumour hard from the first and round; characteristic feel of cervix.
Pain, varying in degree, present. Not so painful as perimetritis.	More painful, pain usually felt previous to swelling.	Pain follows the formation of the swelling.	Not sensitive; pain may be altogether absent.
Retraction of the thigh.	Retraction of both thighs.		
Uterus becomes less movable; is displaced laterally, or is fixed.	Uterus less movable; frequently fixed.	Uterus displaced according to the site of the hæmatocele.	Uterus at this stage generally movable.
Swelling not so diffused.	Swelling more diffused.	Quick diffusion of swelling.	

CHAPTER XVIII.

PELVIC HÆMORRHAGE.

Causation.—It is advisable here to consider briefly and separately the occurrence of pelvic hæmorrhage, its symptomatology and diagnosis, as well as its treatment, general and local. When we come to deal with the subject of ectopic gestation, we must necessarily discuss hæmorrhage in relation to gestation, and the various pathological conditions that we associate with the presence of blood in the pelvis, when a gestation sac has ruptured.

Pelvic hæmatocele was a term applied originally by McClintock (Dublin) to a collection of blood, which is either *enclosed* in the

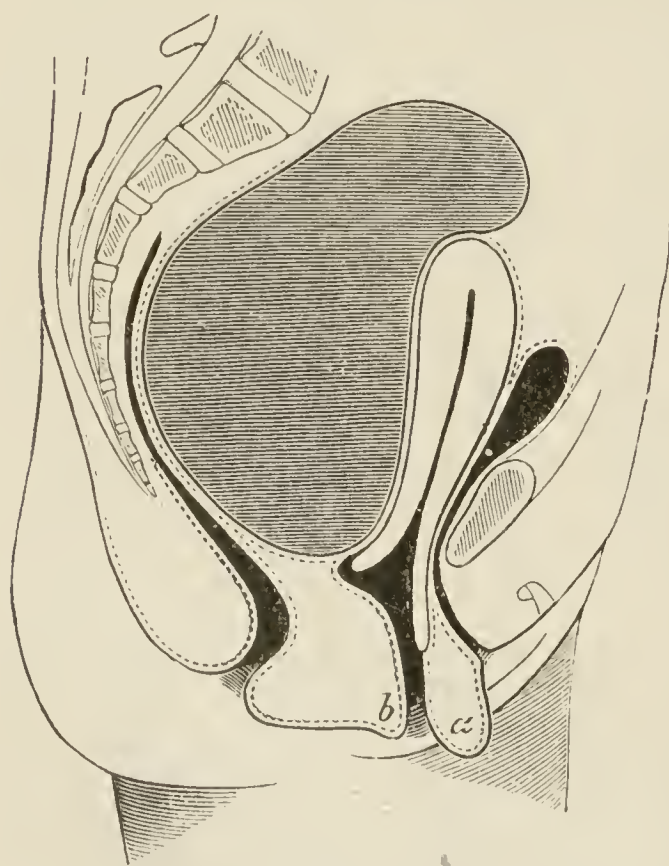


FIG. 257.—RETRO-HÆMATOCELE.
(SCHRÖDER.)

peritoneum behind the uterus, in Douglas' pouch—*retro-hæmatocele* (Nélaton); or in front of the uterus (comparatively rare); between it and the bladder—*ante-hæmatocele*. If the blood escaped posteriorly or anteriorly into the cellular tissue it formed a hæmatoma, by some styled *sub-peritoneal hæmatocele*. If it escaped into the peritoneum, it was called *intra-peritoneal*. It is certain that the term 'pelvic hæmatocele' has created considerable confusion in the minds both of students and practitioners.* This has arisen in consequence of its wide ap-

* See also chapter on Ectopic Gestation, Tubal Abortion, and Tubal Rupture. The term pelvic hæmatocele is now best restricted to an ectopic blood-sac.

plication to any collection of intra-pelvic escape of blood, whether

intra-peritoneal or otherwise. Pelvic hæmorrhage may occur from a variety of causes. Thus, the bleeding may attend on pernicious anæmic states, purpura, malignant jaundice, and during the zymotic fevers. It may happen coincidently with suppression of menstruation from such causes as mental shock, exposure to cold, and coitus. It may be the direct result of such disease in the ovary or Fallopian tube as may lead to the rupture of either (see chapters on Diseases of the Fallopian Tubes and Ovaries). Traumatism is the cause of the bleeding after operations on the adnexa and uterus, or such direct violence as a blow, a kick, a fall, forcible dilatation of the uterus, and violent coitus. It may be associated with atresic conditions in the genital tract from the vulva to the Fallopian tubes. Virchow and Schröder assigned as a cause perimetritis and peri-uterine phlegmon, though these inflammatory conditions must be more frequently regarded as a consequence rather than as a source of the hæmorrhage. When, however, we come to investigate the origin of the hæmorrhage, we find in the great proportion of cases that it is directly due to causes immediately connected with conception and pregnancy. Of these by far the larger number are the result of tubal fœtation. Next in frequency is abortion, and in some rare cases the loss has been brought about by rupture of the uterus in early pregnancy. I prefer the inclusive term 'pelvic hæmorrhage,' though we may retain the term pelvic hæmatoma to express the fact that the blood has escaped into the cellular tissue of the pelvis. We may, then, thus divide the causes of pelvic hæmorrhage into two principal groups—(a) that connected with pregnancy, by far the most numerous ; and (b) miscellaneous.

Causes of Pelvic Hæmorrhage.

(a) Connected with Pregnancy :—

Ectopic gestation (pelvic hæmatocele).

Abortion.

Molar pregnancy.

Rupture of uterus (*in early gestation*).

(b) Miscellaneous :—

Menstrual suppression from	suppres-	{	Mental shock.
	sion from		Coitus.
			Cold.

Disease in the ovary or Fallopian tube	{	Leading to rupture of the blood sac
		in the ovary or Fallopian tube.

Traumatic	{	After operations. Blows, kicks, falls, some overstrain, the use of tents ; forcible dilata- tion of the cervix ; excessive coitus.
Perimetritis and parametritis (<i>Vir- chow and Schroeder</i>)	{	Often associated with ectopic gesta- tion or traumatic causes.
Abnormal blood- states	{	Anæmia. Plethora. Purpura. Zymotic diseases. Jaundice.
Obstruction to the flow of blood, men- strual or other (as in atresia), in the	{	Fallopian tubes. Uterus. Vagina. Vulva.

Pelvic hæmorrhage is more likely to occur during the active period of menstrual life ; but I have known a case in which a considerable escape of blood occurred from a fall off a chair, in a patient over sixty, and have on one occasion seen a large pelvic effusion form suddenly in a severe case of typhus fever.

Symptoms and Physical Signs.—There may or may not have been some previous hæmorrhagic discharge from the uterus or some indication of hæmorrhage such as a feeling of faintness, or slight attacks of syncope attended by pelvic pain. The symptoms in the relative order, and as they usually occur, are—shock, tendency to collapse, great pelvic pain, syncope, sense of weight and pressure in the pelvis, vomiting, fall in temperature, rapid and weak pulse. These symptoms may persist, and death may ensue, despite every effort to rouse the patient. They are all intensified in the intra-peritoneal variety. Their severity will in great measure depend on the quantity of blood which is effused into the peritoneal cavity. When reaction sets in (within forty-eight hours), the patient may suffer from rigors ; the temperature rises, the skin becomes hot, the pulse changes in character. The hæmorrhage may increase or persist. On examination, the abdomen is frequently found tense ; there is abdominal swelling with dulness, especially over the hypogastric and inguinal regions. The abdomen is tender on palpation. On vaginal examination, a mass is found generally

posterior to the uterus—rarely anterior; it is smooth, soft at first, and has a semi-fluctuating feeling. The uterus is pushed forwards against the bladder in retro-uterine hæmorrhage; backwards against the rectum when the blood escapes anteriorly. The bladder is generally encroached on, and retention of urine or dysuria may result. The rectum is compressed. There is either difficulty in defæcation, or rectal irritation may be present with tenesmus and dysenteric symptoms. As the case proceeds, the uterus becomes more fixed, and the mass is harder. The further symptoms and



FIG. 258.—RETRO-UTERINE HÆMORRHAGE (ST. THOMAS'S MUSEUM) FROM A DISEASED OVARY. (ROBERT BARNES.)

It was bounded above by plastic effusions and the small intestine.

local signs depend on the course of the effusion, whether absorption occur or hardening of the mass. Should suppuration follow, and the pus be not evacuated, it finds an exit through the rectum, vagina, or by the bladder. It may escape, though rarely, into the peritoneal cavity. On the other hand, it may slowly disappear without involving these viscera. When suppuration takes place, we have the dangers of peritonitis, septic absorption, and septicæmia.

As illustrative of the fact that cases in which a considerable escape of blood into the meso-metrium, the result of tubal pregnancy, may get well without interference, I may mention a case in which there was presumable pregnancy of the second month, and an effusion that reached to within a few

inches of the umbilicus. It was ultimately reduced to a slight perimetric hardness. The local treatment consisted mainly in hot antiseptic vaginal douches, and Leiter's abdominal irrigator applied externally charged with iced water.

I had once a remarkable case under observation for nearly three years. I was telegraphed for from a distance to see a young married woman shortly after hæmorrhage had suddenly set in. She had a typical conoidal cervix and 'pinhole' aperture, and was in acute pain. The bladder was pressed against by the uterus, which was pushed upwards and forwards, so that it was impossible to reach the cervix with the finger; there was retention of urine, and with the greatest difficulty the rectum was occasionally emptied by enema. She was dangerously ill from the protracted pain and distress, caused by the pressure of an extensive effusion on the pelvic nerves and viscera. This swelling gradually disappeared, and when I last saw her the bowel and bladder acted in quite a healthy manner, and the uterus had fairly regained its mobility, though not entirely. This case shows how protracted such a recovery may be.

Diagnosis.*—Necessarily the most important question is the relation of a pelvic effusion of blood to extra-uterine pregnancy. The difficulty exists of being able to recognize a tubal gestation-hæmatocele apart from other causes of tubal hæmorrhage. As Falk has pointed out, it is most difficult to differentiate rupture, complete abortion (the ovum being expelled into the abdominal cavity), and incomplete abortion, where it remains in the tube. Clinically, such a differentiation is often impossible, nor can we say when the blood is encapsuled. We may be assisted in our diagnosis, as Freund has shown, if there be undeveloped mammæ, very prominent clitoris, and other evidences of cessation of pregnancy. Examination under all circumstances must be carefully and not too roughly conducted.

We must arrive at a diagnosis on the following considerations:—

The history of the case, the suppression of menstruation, previous proofs that conception has taken place, the occurrence of some operation or accident, the presence of a zymotic disease, the evidence of pernicious anæmia, an atresia of the uterus or vagina.

The suddenness in the accession, and the severity, of the symptoms.

The occurrence of hæmorrhage.

The position of the tumour posterior to (as a rule), and not at the sides of the uterus.

The mode of formation of the tumour; its painful nature; its rapid development; its softness in the first instance, and the subsequent hardness, accompanied by shrinking of the tumour.

* See chapter on Ectopic Gestation for the full discussion of these points.

The position and size of the uterus, determined bimanually and by the uterine sound; the independent mobility of the uterus; the later appearance of pus, and the associated reduction in the size of the tumour.

Prognosis.—This must always be grave---much more so in the intra-peritoneal than the sub-peritoneal effusion. There is the danger of collapse, exhaustion from recurring hæmorrhage; pain from pressure; septicæmia, and peritonitis.

Treatment.—Absolute rest; ice over the hypogastrium; ergot given internally, and, better still, by means of the subcutaneous injections of ergotine or ergole (gr. iii. to gr. v.) into the gluteal region; opium later on during the period of reaction, both by the mouth and by the rectum (enema and suppository); quinine with digitalis; stimulants, given by the rectum if necessary, to prevent syncope (iced champagne and brandy are perhaps the best). I have already entered into the question of evacuation of the fluid, and, in order to avoid repetition, must refer the reader to the chapter in which this is discussed (*vide* pp. 149, 150). Such questions as the death of the foetus, and coexistence of a foetal sac and the urgency of the symptoms independently of the hæmorrhage, must decide the question of operation.

Once it has been determined that there is a strong probability of the rupture of a tubal pregnancy, all modern teaching is in the direction of immediate cœliotomy. The friends must at once be warned of this. Such a step will depend upon the nature of the immediate symptoms, and on the presence of such constitutional conditions as persistent or variable high temperature, rapidity of pulse, sickness, attended by local pain, and increase of swelling. (See chapter on Ectopic Gestation.)

This case of pelvic hæmorrhage teaches such clinical lessons that I record it. It is typical of its kind.

Large Tubo-ovarian Ectopic Sac Adherent Omentum and Bowel.

A married woman aged thirty-eight years had had four pregnancies, and one miscarriage. The youngest child was aged fifteen months. The catamenia were regular after the birth of this child. The patient had menstruated during previous pregnancies for several months. During the last pregnancy there was prolongation of the catamenia for some months and a 'show' right through the nine months. A menstrual period commenced at the regular time, but did not terminate as usual, and there was a constant show for two weeks, during which period she complained of violent pain in the left iliac region, with constant nausea and attacks of faintness, and with

pain in defæcation. She was admitted, under Dr. Allen, into Stanmore Hospital, complaining of pain, especially over the left side. There was a swelling in the left inguinal and hypogastric regions, and still some hæmorrhagic discharge from the uterus, the bowels moving with difficulty. There was considerable fulness in the left fornix. The os uteri was patulous, and there was sanious discharge from it. It was decided to dilate the uterus and explore the cavity. This was done with a negative result. When she was a fortnight in hospital pain and distension increased, and the temperature range, which previously had been nearly normal, varied from 100° to 102°. The bowels could not be moved by enema. On the seventeenth day from her admission the abdomen was opened. A large sac, extending above the umbilicus, was discovered. To the anterior surface of this the bowel was adherent in parts, and also the omentum. It was firmly fixed posteriorly and quite impossible to separate. On tapping, the sac was found to contain semi-coagulated blood. The sac wall was, therefore, freely opened and the contents turned out. The edges were pared and the sac was stitched by interrupted fishing-gut sutures all round to the peritoneum, which was then brought together and sutured, leaving sufficient space for a drainage-tube. The patient made an uninterrupted recovery. The contents of the sac were afterwards carefully examined for the presence of a mole, but such could not be found. No tube or ovary could be detected on the left side. There had evidently been recurrences of hæmorrhage, and a recent bleeding within the few days prior to the operation explained the symptoms from which she suffered and the sudden increase in the size of the swelling.*

Rupture of Ovarian and Tubal Cysts.—The possibility of rupture of ovarian and tubal cysts happening suddenly has to be remembered. I have on several occasions removed large-sized blood-cysts from the parovarium and tube. The contents of such cysts cannot be diagnosed save by operation, or aspiration through the vagina, a step not devoid of risk.

In all other cases than those in which the hæmorrhage is the consequence of conception, my experience of pelvic hæmorrhage would lead me not to interfere hastily with any collection of blood

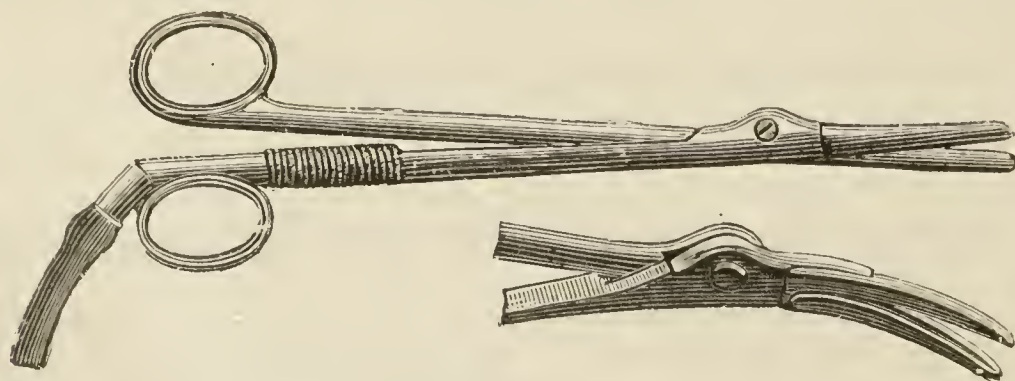


FIG. 259.—PAQUELIN'S CAUTERY SCISSORS.

or coagulum. The aspirating-needle may be used both for the purpose of exploration and also for the determination and evacuation of pus. Should not this answer, and the fluid reaccumulate, an

* Page 385. See Ectopic Gestation.

opening should be made with the guarded bistoury, Landau's branched dilator and trocar (Fig. 121), or the thermo-cautery (Fig. 259), and the cavity subsequently washed out with some weak ($\frac{1}{10000}$) bi-chloride of mercury or formalin ($\frac{1}{2000}$) solution. It is a question if this latter be not the safest method of puncture of a purulent intra-peritoneal collection of pus, the cavity being drained subsequently and tamponing the vagina loosely with sterilized iodoform gauze.

In extra-peritoneal hæmatocele, a branch steel dilator may be employed to enlarge the vaginal opening and admit the finger and a drainage tube, the strictest asepsis being maintained.

Expectant and Radical Treatment of Hæmatocele.

There is a valuable communication by Paul Zweifel,* being an address to the Leipzig Medical Society, given in June of the same year. In it he deals with the expectant and radical treatment of hæmatocele. He strongly advocates immediate operation in recently ruptured tubal gestation, quoting cases in which the pulse at the wrist was imperceptible, and yet the operation was followed by recovery. In internal bleeding he says 'the indication to open the abdomen at once, arrest the hæmorrhage and remove all the effused blood, is, of course, not merely valid in case of primary rupture or erosion of the tube, but is equally stringent in secondary hæmorrhage.'

He urges that secondary erosion occurs not so infrequently as Aschoff and others contend. Rupture of the encapsuled hæmatocele is a source of urgent danger. He thus describes posterior colpotomy for hæmatocele: It 'consists in opening, layer by layer, the posterior vaginal vault and pouch of Douglas, evacuating the clotted blood by breaking it up with two fingers, washing away any remaining clots, and, finally, after drying it out, plugging the cavity with iodoform gauze. This operation is so simple that it may be performed without anaesthesia, as I have done it even in private practice. But care must be taken that in evacuating the blood the capsule is not broken, and that no blood masses are left round the ovum in the tube, for, after opening from below, such masses always decompose, and, unless the drainage is absolutely free, the decomposition leads to fever and sepsis.

'If all go well, posterior colpotomy is without danger, and in a fortnight the patient is able to get up. When such blood masses as I have alluded to remain in the tube, I prefer, for sake of safety and uninterrupted healing, to complete the intervention by an immediate laparotomy, and, removing all the blood from above, to fill the sac with iodoform gauze and shut it off entirely from the peritoneal cavity.'

The most careful investigation of 107 cases treated in the Leipzig klinik showed that 57 per cent. of those treated expectantly recovered; in forty cases in which laparotomy was performed, there were three deaths, but these three occurred from such causes as purulent peritonitis and tuberculosis, profuse internal hæmorrhage, and the rupture of a suppurating hæmatocele. On the whole, from a summary of 211 cases of Zweifel's, and 215 of Thorn's, in which 53 to 55 per cent. and 65 per cent. relatively were treated by conservative measures, Zweifel, though, as he says, 'the alleged advocate of interference,' adopted the expectant method in this large number of cases of hæmatocele.

* *Brit. Gyn. Jour.*, Nov., 1903.

CHAPTER XIX.

LACERATION OF THE CERVIX.

THIS lesion, varying in the number and depth of rents or fissures of the cervix, and the degree of pouting of the cervical canal, is the consequence of labour. It results most frequently from manual or instrumental interference, and too early rupture of the membranes. In short, it is often, though by no means necessarily, the fruit of 'meddlesome' midwifery and hastily conducted labours. In rapid labours, in which delivery is precipitated, such rents are apt to occur.

The rent is generally transverse, for, as Goodell points out, the fissure-line, when lying in this direction, crosses the axis of motion of the uterus, and hence the tendency to separation of the flaps. At other times the fissures are multiple, as in this drawing after Emmet.

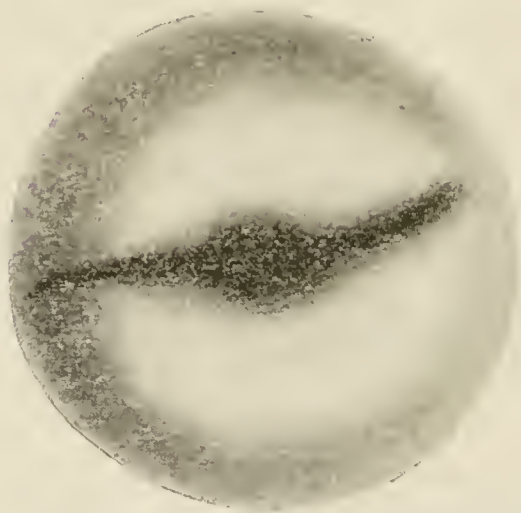


FIG. 260.—BILATERAL LACERATION.

According to the same authority, laceration is most frequent on the left side, this being attributed to the position of the child's head in the right oblique diameter, the occiput lying anteriorly to the left. The percentage of women suffering from uterine disease, who are subject to laceration of the cervix, has been variously esti-

mated at from ten to forty per cent. (Schroeder, Mundé, Ambrose, Pallen, Barker, Emmet, Goodell).

That the cervix uteri is more or less torn in a large proportion of labours all will admit. Many such rents close spontaneously, and a considerable number cannot be said to cause either ill consequences or any suffering to the woman.

Surgeons must not take up any extreme view of the necessity for interference in every case of lacerated cervix. Its relation to

morbid womb conditions is now generally acknowledged, and we have especially to thank American gynæcologists for this, as for many other valuable additions to uterine pathology. We have, however, to avoid being influenced in practice by an exaggeration of the results which follow from a laceration. A careful examination of the uterus will enable us to judge of the case demanding operative interference, and the one which may safely be dealt with by palliative measures, or let alone.

Authorities are still divided as to the etiological importance of laceration of the cervix, in regard to various uterine pathological conditions.

For example, Emil Noeggerath declares that 'women are *more* likely to conceive when there is a laceration than when there is not; the position of the uterus is *not* affected by laceration, its axis is *not* elongated as a consequence, erosions and ulcerations are *not* more frequently met with lacerations than without, they have *no influence* in producing uterine disease, eversion of the lips is *never* the direct result of a laceration.' Noeggerath goes so far as to assert that laceration will soon disappear from the list of pathological affections of the uterus, and that operations for their cure will be things of the past. On the other hand, Mundé declares that cervical lacerations do act as predisposing factors in the production of uterine disease, the frequency and severity of the lesions increasing directly in proportion to the length and depth of the tear. He also arrives at the conclusion that they lessen the productive fertility of a woman.

I believe that the truth lies in the mean between these two extremes of opinion—certainly rather on the side of the view generally held by American gynæcologists on the importance of lesion.

It is my belief that extensive lacerations, followed by ectropion of the cervical lips, follicular degeneration,

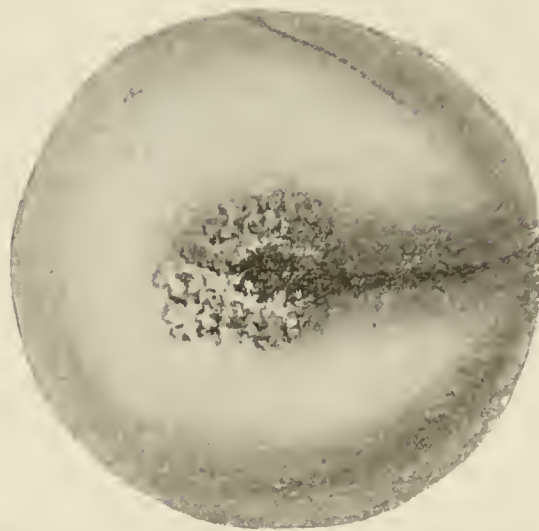


FIG. 261. — UNILATERAL LACERATION OF THE CERVIX, WITH ENDOMETRITIS AND EROSION. (AUTHOR.)

Curettage, chromic acid (grs. xxx., ad 31), laceration closed, nitric acid applied to erosion.

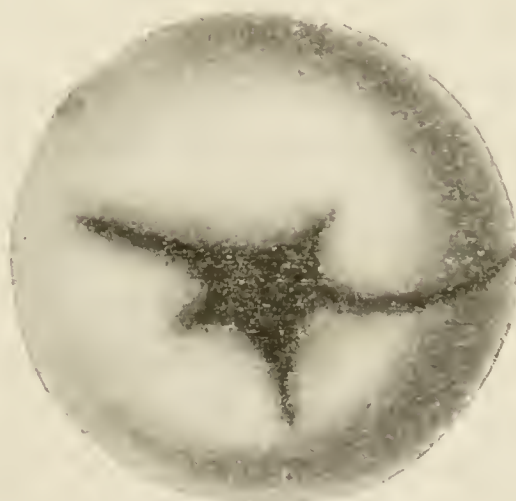


FIG. 262. — STELLATE LACERATION.

and erosions, do predispose to malignant change in the cervix. As Skene Keith has rightly insisted, the scar tissue of an old laceration is responsible for much of the trouble that follows it.

With regard to recent lacerations, many urge, and apparently with reason, that the sooner the rents are closed, the better, the sutures acting also as a hæmostatic. It is asserted that the lochial flow does not prevent primary union, but any such operation must be conducted with every possible antiseptic precaution. Doderlin, Sanchez, Toledo, and Strauss have shown that the normal lochial discharge, when taken from the uterus, is devoid of germs, but that if there be fever, both bacilli and cocci are found, which are eliminated with more abundant secretion of a purulent character. The pathogenic microbe is the *Streptococcus*. Similar germs have been found by Péraire in the secretions of puerperal metritis.

I could instance several cases of women restored to health and procreative capacity, whose lives were miserable before extensive lacerations were cured, and I have seen several cases in which I believe the predisposing cause of serious uterine disease lay in old eversion and erosion, the consequence of an unremedied rent in the cervix.

Diagnosis.—Though in the majority of cases there is not any difficulty in discovering a laceration of the cervix by a careful examination, still there is but little doubt that it often escapes detection. This is more apt to occur when there is a considerable abrasion of the cervix, or when the cylindrical speculum is used. In the latter case we may press the lips of the fissure together, and thus close the torn lips of the mouth of the womb.

An examination for a laceration of the cervix should be made in the dorsal position or in this manner: The woman is placed in the semi-prone position, and Sims' speculum is applied: a tenaculum or hook is used, and the two lips of the rent are drawn forwards, when, if it be a laceration, the raw surface disappears, and the characteristic cleft is left.

Consequences.—Erosion and ectropion of the os and cervix; eversion of the cervical canal; menorrhagia and metrorrhagia; subinvolution; endometritis; parametritis and perimetritis; adnexal disease; cicatrization of the cervix, and sterility. There is little doubt that it predisposes to epithelioma and malignant disease of the cervix.

Symptoms.—These will depend, in urgency and severity, on the extent and depth of the laceration, and the inveterate character or

the intensity of the attendant complications. If the laceration be chronic, we frequently find an easily-bleeding cervix, menorrhagia, endocervical discharge, pain in walking, loss of sexual desire, neuralgia, and reflex nervous disturbances.

Treatment.—It is either palliative or operative. The palliative treatment consists in rest, warm vaginal douches ; local depletion, attention to the eroded cervix ; glycerine, ichthyol, and glycothymolin tampons ; astringent douches. Also, such remedies as tampons of borax and glycerine, tannin and glycerine ; applications of carbolic acid and glycerine with iodine or ichthyol ; chromic acid solution, and the other means spoken of for the treatment of menorrhagia, may be applied.

John Taylor* instances as the consequences of lacerations, malpositions of the uterus, interference with the nutrition of the cervix, tendency to sepsis, endocervicitis and endometritis, atrophy of the uterine wall, sterility and abortion. Epithelioma he regards as only a very rare result.

Operative Measures.—Such palliative treatment should be pursued in order that the uterus may be brought into a fit state for operation, when all symptoms of metritis, or peri-uterine inflammation, have disappeared. The week after a menstrual period is chosen. The instruments required are a vaginal douche, a duck-bill speculum and a few vaginal retractors, two vulsella, a long-handled knife, a curved and angular scissors, short lance-headed needles of Emmet or Sims, curved needles, needle-holder, forceps, silver wire, gut or silk, a few perineorrhaphy hooks.

Trachelorrhaphy is thus performed. The patient is brought well over the edge of the operating table in the lithotomy position. The vagina is thoroughly sterilized. The cervix is exposed, drawn down with the vulsellum, and kept in position by an assistant. The edges of the laceration are first brought together to judge how far the uterine surfaces have to be denuded. This we can readily understand when we recollect the compression exerted by it on the cervical nerves, and the obliteration of the glands and vessels.

The operator begins by denuding one side of the laceration, and removing the tissue, as shown in the drawing. The cicatricial tissue in the angle of the laceration is completely removed. The same step is taken on the other side if the laceration be bilateral. Each lip of the laceration at either side is seized in a vulsellum, and both are brought together so as to see the effect of the denudation.

* *Brit. Gyn. Jour.*, Nov., 1903.

The sutures are now passed and the rent is closed. Chromicized cumol gut answers the purpose well. A broad strip of the cervical surface is left untouched, to form a future cervical canal.

Fig. 263 shows the surface denuded, and the course of the sutures,

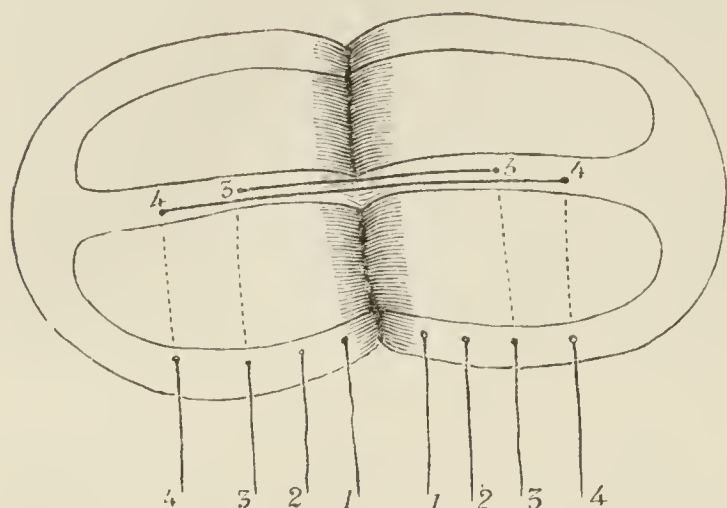


FIG. 263.—EMMET'S OPERATION—DENUDED SURFACE AND SUTURES.

after Emmet. Fig. 264 exemplifies the way in which the sutures lie in the cervix before they are tightened. Fig. 265 explains the closure of the cervix and the tying of the sutures. The sutures are passed in the order 1, 2, 3, 4. One side is first united and closed, and afterwards the others. The entire operation is performed

with the strictest aseptic precautions. For the first forty-eight hours the vagina is kept tamponed with sterilized iodoform gauze. After

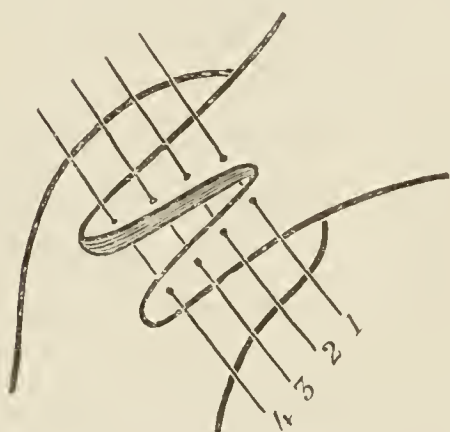


FIG. 264.—SUTURES PASSED.

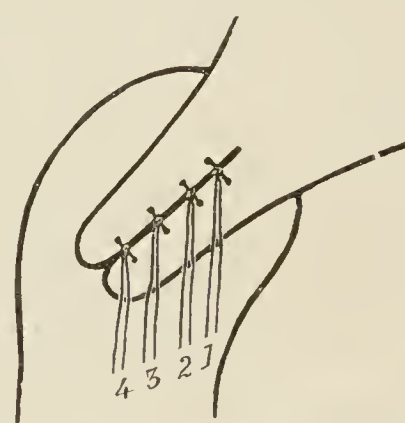


FIG. 265.—SUTURES APPLIED.

this it is douched out with formalin solution (1 in 2000), and then a loose tampon of iodoform gauze or moistened chinosol is placed in it. This is repeated daily. It is better, after operating, to draw off the patient's urine, but from the third day she may pass water herself, leaning forward on her knees. If silver-wire sutures be used, they should not be disturbed for ten or twelve days. The mistake which causes many failures after all perineal, utero-vaginal, and vesico-vaginal operations is too early interference with the sutures.

There is just one caution in regard to the closure of a laceration which it is well to give. The object of the operation is to restore the cervix uteri to its normal condition, and the os uteri to the shape and size it would naturally present afterwards in the multipara

under ordinary conditions. It is not right to so close the cervical canal that conception or labour are interfered with. In short, not, as a patient once remarked, to have the uterus so stitched that it had to be "unstitched" and "restitched" for the undoing of the former stitching.

Examination at and after Childbed.—Many Continental and American authorities have urged that after all labours the uterus should be examined at least before the end of the puerperal month, when the patient frequently passes from under the care of the practitioner. This doubtless would be an admirable rule to follow whenever feasible. Unfortunately attention at the time of delivery is generally concentrated on the preservation of the perineum, and any injury which may happen to it. In instrumental delivery, especially where there is difficulty in the delivery of the head, or when version is performed, the cervix suffers as well as the perineum, and we know that severe postpartum hæmorrhage is frequently caused by deep lacerations of the cervix as well as those of the perineum. Therefore, in instrumental delivery, and when there is hæmorrhage after the placenta is delivered, an examination of the cervix ought to be made, and any rent should be immediately closed with aseptic gut. This will not only arrest the present bleeding, but also anticipate one of the causes of "secondary hæmorrhage" (McClintock) and subinvolution of the uterus, which undoubtedly are occasionally due to cervical lacerations. *No patient should pass out of the obstetrician's hands after parturition before he has ascertained that the integrity of the cervix has not been seriously interfered with.*

CHAPTER XX.

UTERINE NEOPLASMS—POLYPUS UTERI.

THOUGH polypi are properly included in the description of uterine neoplasms, a uterine polypus is a sufficiently characteristic growth to warrant, for clinical purposes, a distinct study.

Polypi we may classify according to the elementary tissues from which they take their origin—cellular, glandular, fibrous, placental.

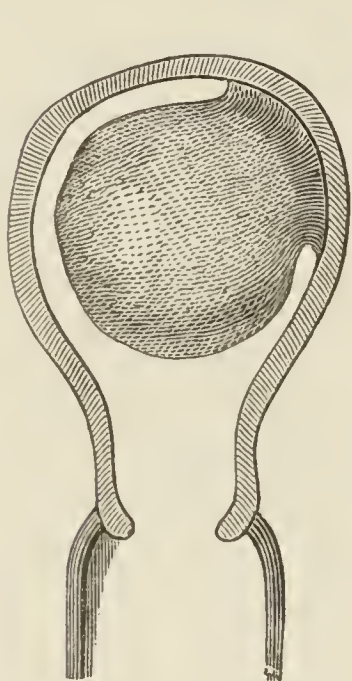


FIG. 266.—SUBMUCOUS FIBROID.



FIG. 267.—OUTLINE DIAGRAM OF POLYPUS OF CERVIX. (ADAPTED FROM THOMAS.)

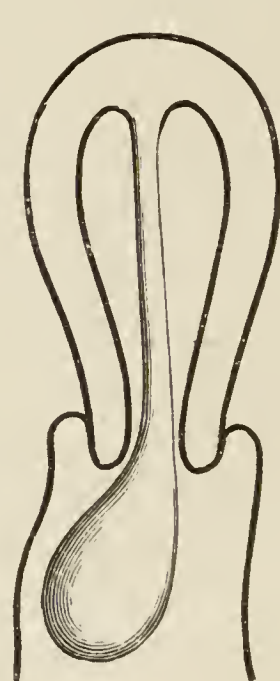


FIG. 268.—OUTLINE DIAGRAM OF POLYPUS WITH LONG PEDICLE ATTACHED TO THE SUMMIT OF THE UTERINE CAVITY: THE CERVICAL CANAL CONTRACTED ON PEDICLE.

This may lead to partial inversion.

The first variety, springing from the cervix, consists principally of cellular tissue and mucous membrane; the second (also arising from the cervix) of hypertrophied follicles and connective tissue; the third of muscular and connective-tissue elements, the former preponderating. Placental polypi have their origin in portions of placenta that have been left in utero, and which, becoming organized and incorporated with the uterus, form polypi.

PLATE XXVII.



PLACENTAL POLYPUS. (BUMM.)

Prep. in Frauenklinik in Basil. A, B, utero-placental arteries; C, E, internal and external os; D, polypus projecting from uterus; F, placental attachment with blood coagula.

[To face p. 392.]

Fibroid polypi spring from the body of the uterus, and are at one period of their growth submucous fibroids. They assume the form of the polypi through extrusion into the uterine cavity, and by gradual narrowing of the base of attachment into a pedicle.*

Diagnosis.—This will depend on the size and position of the polypus. Whenever obscure menorrhagia or metrorrhagia occurs and persists, especially if the discharge continue foul and offensive, there is but one safe rule, which is to dilate and explore the uterus. The presence of a polypus can be then determined (see p. 89).

Dysmenorrhœa and Menorrhagia.—It must be remembered that a small polypus may be concealed in utero and cause severe dysmenorrhœa without the occurrence of menorrhagia or any perceptible uterine enlargement.

We may be further led to suspect that a polypus is present if there be some enlargement of the fundus, and the cervical canal is more patulous than in the normal condition.

Importance of Full Dilatation.—The first step towards the diagnosis and treatment of polypus is free dilatation of the cervix. The facility with which we can feel the growth will depend on its size and position. At times this is comparatively easy ; occasionally it is very difficult. An extra-uterine polypus is, of course, felt at once with the finger. The principal danger is that we may confound a large growth with inversion of the uterus. We are not likely to mistake it for prolapse.

* See pp. 400, 405.

† See chapter on Follicular Degeneration.

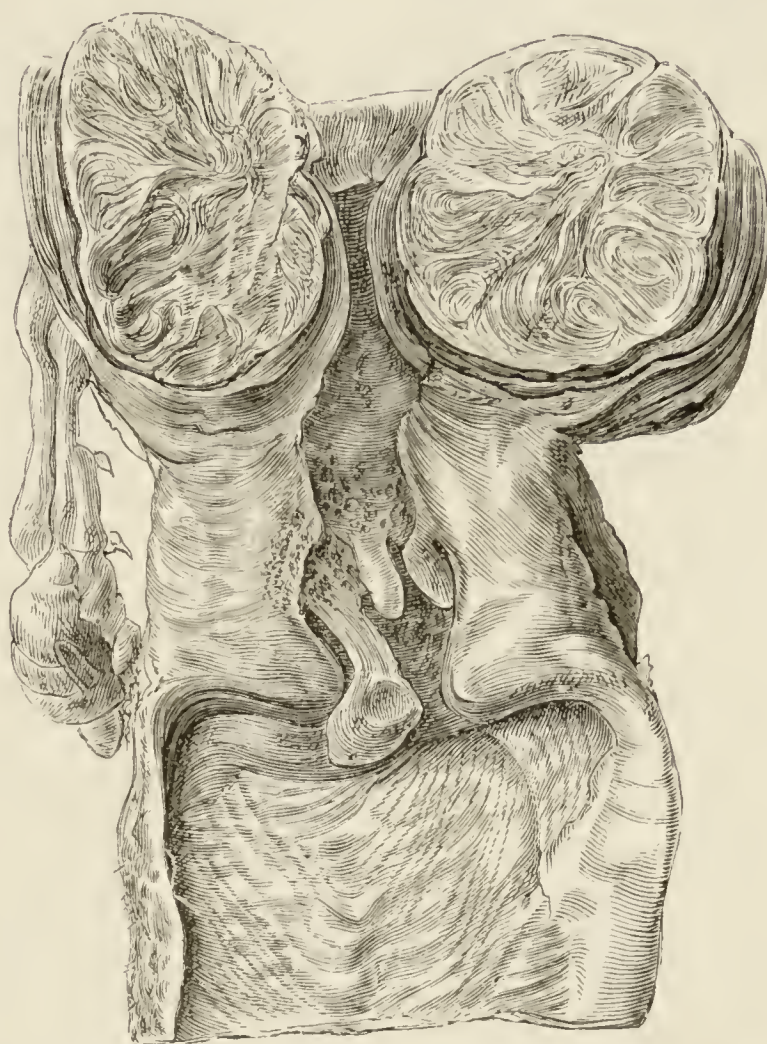


FIG. 269.—FIBROID TUMOUR OF THE UTERUS, SHOWING ENCAPSULATION IN THE UTERINE PARENCHYMA, AND THE ATTENDANT DEVELOPMENT OF CYSTIC POLYPI IN THE CERVIX. (ST. THOMAS'S HOSPITAL, ROBERT BARNES.†)

Two-thirds natural size.

A curious case, showing how one may be mistaken if the uterus be not dilated, occurred to the author :—

Retrocession of a Polypus.—A lady, in whom pregnancy was diagnosed, consulted me to verify the opinion. On examination, I was surprised to find a bleeding fibroid polypus protruding from the uterus. I advised its removal. She had severe hæmorrhage the next few days, and operation had to be unavoidably postponed. When placed under ether, which she insisted on having, to my surprise there was no polypus visible. I passed a uterine sound into the cavity, and as far as I could judge it moved freely in utero. I could discover no growth. I came to the conclusion that the polypus had become detached during the hæmorrhage of the preceding days. A week subsequently there was a return of bleeding and some watery discharge. On examination, I again saw the polypus appearing at the os uteri. I removed it on the following day, and found the pedicle attached to the fundus. It would appear that on the previous occasions, under the influence of ether, the growth had returned into the cavity of the uterus and so passed out of sight.

Recurrent Intra-uterine Fibroid as an Undetected Source of Dysmenorrhœa and Metrorrhagia.—In February, 1895, I exhibited an intra-uterine polypus at the Gynæcological Society, removed from a patient aged 32, recently married, in whom the loss of blood and aggravated dysmenorrhœa had brought about a most serious anæmic condition. Not long before I saw her, and previous to her marriage, the uterus had been dilated and curetted by a distinguished obstetrician. The submucous tumour was the size of a small pear. I discovered the intra-uterine growth when proceeding to divide the cervix (under an anæsthetic), as from the recent curettage I did not suspect its presence. The adnexa were healthy. Evidently the curette had passed round the growth, and the imperfect dilatation had not revealed it. The case was one showing the value of anæsthesia in diagnosis, and the importance of sufficient dilatation and exploration in dysmenorrhœa and metrorrhagia. On two subsequent occasions, at intervals of some twelve months, I removed large intra-uterine polypi from the uterus of this patient. She is now a robust woman, and has three children.

The following case needs no comment to show the necessity for great care in the diagnosis of intra-uterine growths :—

Salpingo-oöphorectomy performed for Hæmorrhage—Actual Cause discovered to be Polypus.

Fancourt Barnes recorded a case in which the appendages were removed on account of excessive metrorrhagia. The loss of blood had been so severe and reiterated that the patient was rendered extremely anæmic, pulseless, and almost moribund. Intra-uterine medication had afforded some relief for a time, but the hæmorrhage had returned and ignipuncture was tried with a like result. The left ovary was cystic and adherent, but the right was free. For some months afterwards there was no bleeding, but again the hæmorrhage recurred. Lawson Tait saw her, and advised curettage. The uterus was

dilated for this purpose, with the result of revealing the presence of a small sessile fibroid growth, which was removed with the scissors.

There is a complication which has to be kept in mind. A patient, a multipara, is suffering at the menopause from metrorrhagia. The uterus is enlarged, the cervix soft and follicular; there is some discharge from the canal. We dilate the uterus, and discover a small polypus—possibly two. These we remove. Still the metrorrhagia continues. There has been chronic hyperplasia, and endometritis antecedent to and attendant upon the growth of the polypus. It is in these cases that curettage, or the application of nitric acid, should follow the removal of the polypus. This is the classical case in which *atmocausis* would be indicated after curettage.

Clinical Evidences of the Presence of a Polypus.

We may thus tabulate the positive and negative signs of uterine polypus :—

Positive.—A tumour which has slowly increased in size, pyriform in shape, having a narrow neck or pedicle, insensible to touch, not painful when punctured, and varying in size.

Hæmorrhage is a constant accompaniment of polypus, and there may be a foul sanious discharge.

If the tumour be in utero, the sound passes into the uterus from two and a half inches upwards, the cavity of the uterus being enlarged to accommodate the growth; if in the vagina, we can trace the pedicle of the polypus to the cervix, and the uterine sound passes above this, inside the cervix, for over two and a half inches. The encircling ring of the cervix is traced below or around the pedicle, and the uterine sound can be passed inside the cervix, between the wall of the uterus and the tumour.

By careful conjoined examination the fundus can be felt in position, and has no marked depression. Thus the size and consistency of a polypus may be estimated: it may occur in nulliparous women and virgins.

Important Negative Signs.—Absence of the os uteri; absence of sensitiveness, and commonly freedom from pain.

Symptomatology.—The principal symptoms are: Hæmorrhage, uterine pain, vesical and rectal distress (dependent upon the size of the polypus and its position); dragging pain in the back, and

perhaps difficulty in walking if the polypus be large ; occasionally, dysmenorrhœa.

Removal.—We remove a polypus by means of the *écraseur*, the galvanic cautery wire, the polyp tome, or by hysterectomy. Small polypi may easily be twisted off.

If the growth be intra-uterine, the uterus should be thoroughly dilated. An anæsthetic is as a rule not necessary. The removal is not sufficiently painful or distressing to require it. In the instance of some very large polypi in nulliparous women and virgins, it is well, for a few days previous to operating, to distend the vagina

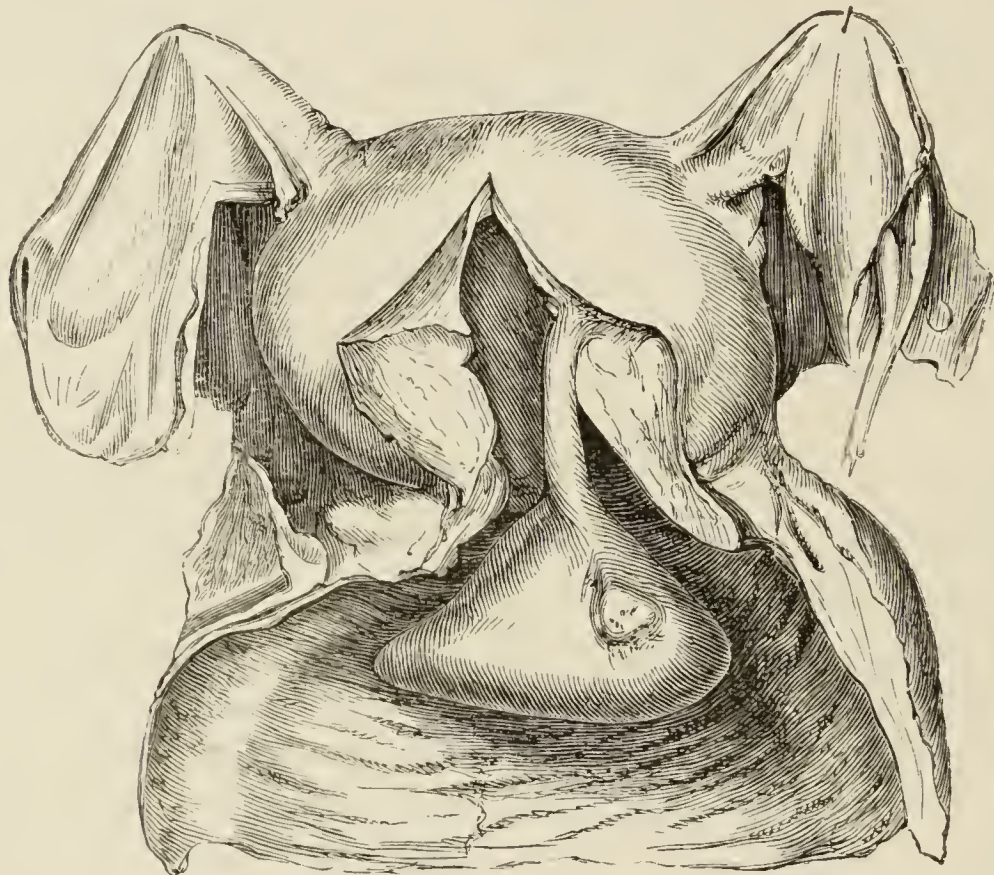


FIG. 270.—FIBROID POLYPUS WHICH HAS BEEN EXTRUDED FROM THE UTERINE CAVITY AND RETAINS ITS SHAPE. (COLLEGE OF SURGEONS, ROBERT BARNES.)

Half-size.

with a Barnes's larger-sized hydrostatic bag. The woman is given a dose of bromide of potassium the night before the operation. She is placed in the lithotomy position on a suitable couch or table, and by means of the fingers or a notched director the wire is carried well up to the pedicle of the tumour ; after which manœuvre, the *écraseur* having been pushed as far as the neck of the polypus, the wire is gradually tightened. It can be now adjusted to the pedicle, as near as possible to the uterine wall, without injury to the latter. The tumour is then removed by *slowly* tightening the wire and resting at intervals in the usual manner.

Any complaint of pain is an indication of injury to the uterus.

When severed, and loose in the vagina, the tumour may be removed by an ovum forceps. If the polypus be very large, and cannot after its detachment be brought away, or if it endanger the perineum and its vessels, it must be divided with a polyp tome. Sir J. Y. Simpson devised a cutting-hook for the purpose (Simpson's polyp tome). The perineum has been incised at either side of the median line, in order to enlarge the outlet, so as to facilitate the removal of a large polypus.

Some years ago I removed from the uterus of a nullipara a polypus larger than an average size foetal skull, and experienced considerable difficulty in its extraction from the vagina. This I effected by lateral incisions of the perineum. I then felt the want of some instrument (which would combine

the purpose of forceps and cutting-knife) for the safe removal of these large growths without the necessity of incising the perineum, or the risk of lacerating it. The application of the *écraseur* to divide the tumour into segments is tedious, and at times difficult. To meet such difficulties I devised an instrument consisting of a straight forceps, lightly made with slender blades, yet sufficiently strong to compress the tumour. A groove

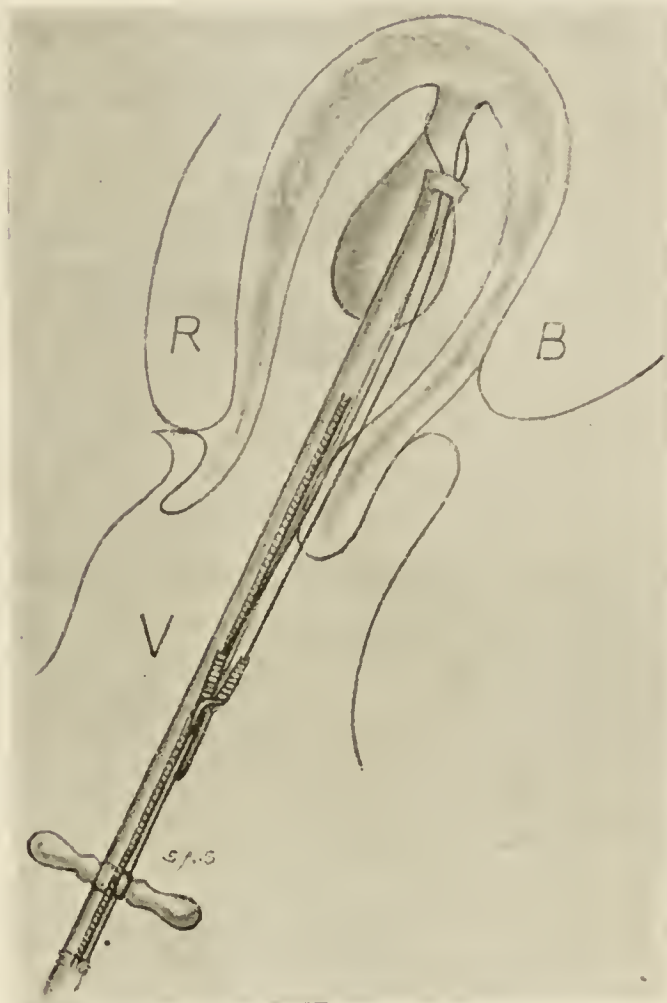


FIG. 271.—APPLICATION OF ÉCRASEUR TO POLYPUS.

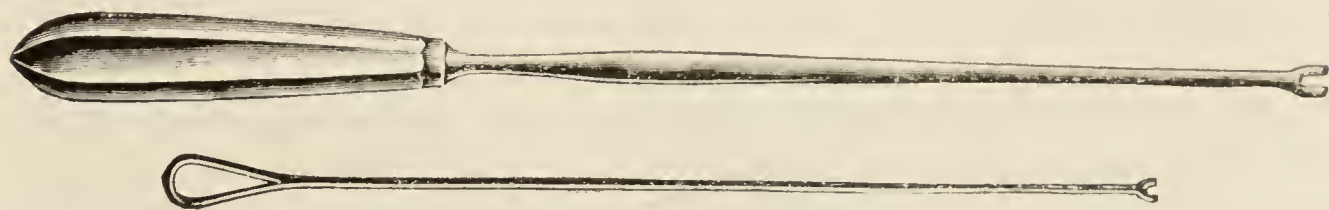


FIG. 272.—WIRE CONDUCTORS.

is cut in the lower fourth of these blades, and they are so shaped inside that the edge of a movable knife or saw glides easily along the blade. They lock readily on a revolving pivot, and the same lock carries a short sheath, through which the knife passes. The handle of the forceps is at right angles to the shank, and each half is connected by a rack and pinion-bar. A cutting blade accompanies the forceps, shaped somewhat like a dagger, so as to readily pierce any tumour, and cut from the centre outwards; a second is a fine saw. These

are made of the finest tempered steel. The tumour can thus be grasped and cut through the centre. The blades are either turned round in the vagina, or the forceps may be applied in a different direction, and the mass cut in four or more pieces. These segments may be separately withdrawn. It is im-

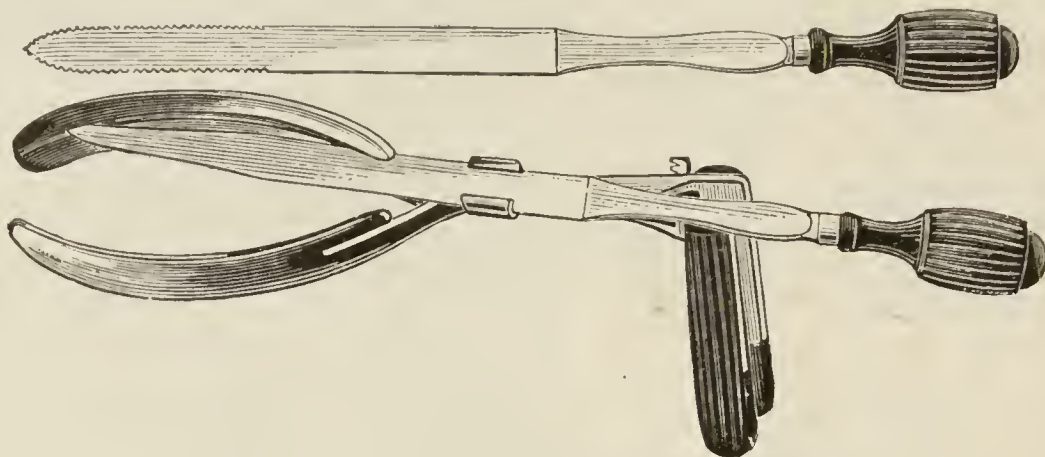


FIG. 273.—AUTHOR'S POLYPTOME.

possible to divide across, even with such an instrument, a large and possibly calcified fibroid. It is better to apply the forceps, and, if there be a risk of laceration of the perineum, to make two divergent cuts at each side of the fourchette so as to enlarge the vulvar orifice. These are closed after removal. The usual antiseptic precautions are taken both before and after removal.

Large Polypus adherent to the Vagina.

I showed at the Gynæcological Society a large fibroid polypus covered with rough adhesions. It completely filled the vagina, and was quite as large as a foetal skull. On passing my fingers into the vagina, I was surprised to find the tumour quite adherent to the vaginal wall. The breaking down of the adhesions was attended by the most profuse hæmorrhage, which ceased when the tumour was detached. I had considerable difficulty in getting the rope wire above the mass. In this case, by drawing the perineum well back with the Sims speculum and using a large vulsellum for delivery, the polypus was removed without injury to the perineum.

Hysterotomy.—Clarence Webster * quotes a case of Veit's, in which, after dilatation of the cervix, he was unable to remove a polypus. In order to get more access to it, he cut through the attachment of the vagina to the anterior wall of the cervix by means of a transverse incision, and then separated the bladder almost as far up as the isthmus. He next divided the anterior wall of the uterus by a median incision as far up as this point, and was thereafter easily able to remove the polypus. The incision was again closed, and the vagina united to the cervix.

* *Brit. Gyn. Jour.*, Feb., 1895.

CHAPTER XXI.

UTERINE NEOPLASMS (continued).

MYOMA.

Etiological and Pathological.

Etiology and Pathology.—Uterine fibroids occur frequently in women otherwise perfectly healthy, and often appear when no predisposing or exciting cause can be traced. The period of life has much to say to their occurrence. We understand this relationship if we remember the active influence of ovulation and pregnancy on the uterine tissue. They are found most frequently from the ages of thirty to fifty, and in married women. Still, they are often met with in the unmarried, and in women under thirty. There is a relationship also between uterine fibroids and sterility. Both are constantly associated with an old history of dysmenorrhœa. It is curious that the African races, in which malignant disease is not a common affection, should be so liable to fibroid tumours.

Fibroid growths of the uterus have their origin in the muscular and connective tissues in the wall of the uterus, and more especially those of the body. In this pathological departure from the normal anatomical relations of the tissues in the uterine parietes the vessels appear to play an important part. The name ‘fibro-myoma’ expresses the constitution of the tumour most frequently found. The term “myoma” is now more generally employed to embrace those growths previously known as “fibroid” and “fibro-myoma.” Some tumours present more the character of the muscular, others of the connective-tissue elements. The tumour is proportionally hard, according to its age and the development or preponderance of the fibrous tissue.

With regard to the vascularity of fibroids, save in the very large varieties, the arteries are not numerous. Yet the fact that the *bruit de souffle* is occasionally heard shows the size which may be attained by the vessel. The veins, especially those of the periphery,

are large. A condition of venous intussusception, with fibromatous fibres interlacing, has been termed by Virchow 'telangiectasis,' or cavernous myoma. Fibromatous polypi are not vascular, and the pedicle seldom contains vessels of any size, while those which are present are remarkable for their retractile quality. Klebs has described lymphatic spaces between the bundles of fibres. Nerves have been traced into them by Bidder and Herz.

Alban Doran says: 'The muscle-cells of a myoma are usually larger than those of the uterus in which it grows. Hence in a myoma removed during pregnancy they appear very large. Fig. 274 represents a section of a myomatous tumour of the uterus, removed at about the fourth month of pregnancy.

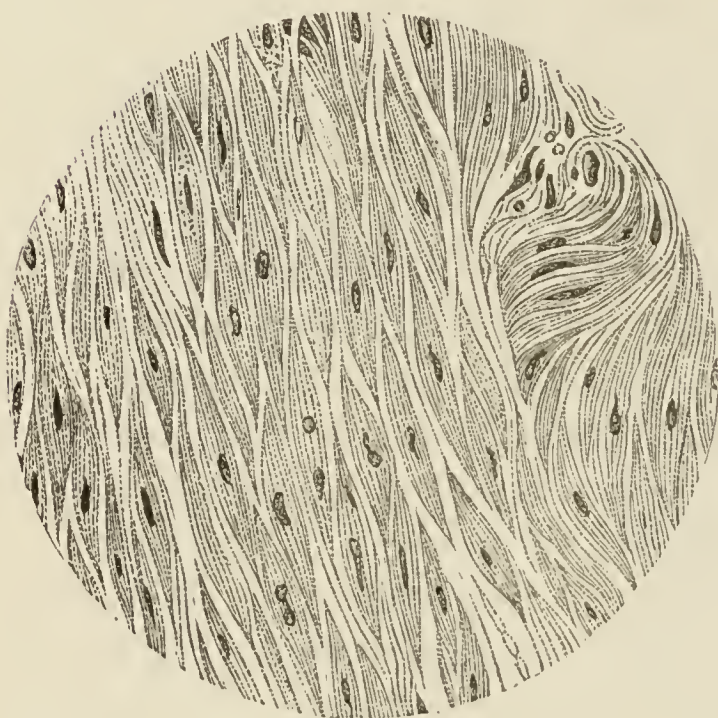


FIG. 274.—MYOMA OF A PREGNANT UTERUS, SHOWING EXTREME HYPERTROPHY OF THE MUSCLE-CELLS. (ALBAN DORAN.)

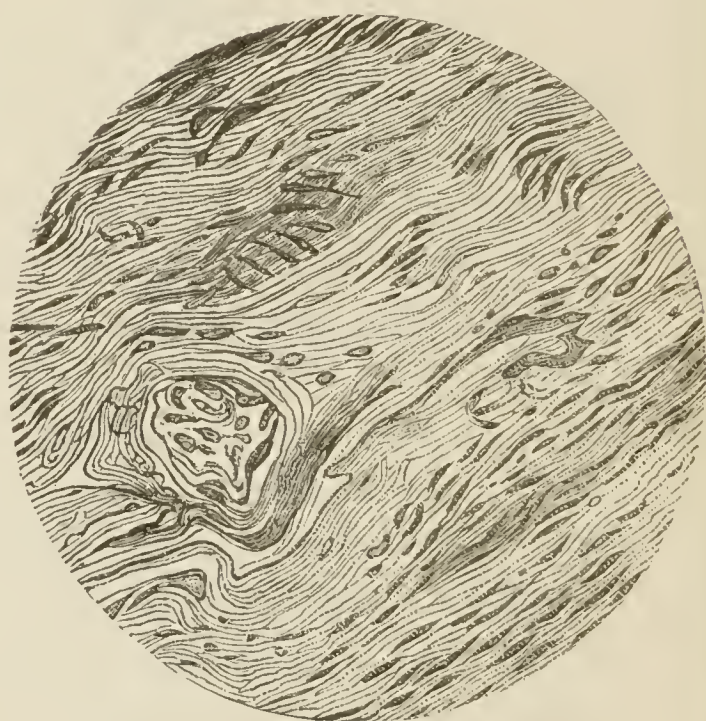


FIG. 275.—FIBROMYOMA OF THE UTERUS.

In some parts of the field the muscle-cells and the fibrous tissue lie separate; in others they are closely blended.

'By the term fibro-myoma is implied a uterine tumour where groups of muscle-cells are blended with, or completely separated by, conspicuous tracts of true fibrous tissue. A small amount of young connective tissue as seen in the uterus is never absent from a pure myoma; in fibro-myoma we see well-defined wavy bands of white fibre. Microscopically no two sections of fibromyoma of the uterus look alike. Sometimes wide bands, purely made up of muscle-cells, predominate; sometimes the field is covered with white fibre, resembling that of which a fibroma of the ovary (Figs. 274-276) is entirely composed. Lastly, the muscle-cells, or at least structures resembling them in size and appearance, may be intimately connected with the fibrils which make up the fibrous bands. This latter condition is well indicated in Figs. 274, 275, which represent a section of a pedunculated subperitoneal "fibroid."

Of all "fibroids," fibro-myoma is the commonest form. The presence of connective tissue in myoma, and also in fibro-myoma, probably accounts for the malignant degeneration of "fibroids," of which cases have been recorded.'

Mode of Origin of Myoma and its Development.

In an interesting historical summary of the development of the pathology of fibromyomatous tumours, as also in his work on 'Uterine Tumours,' Roger Williams* arrives at the conclusion that there are 'good reasons for believing that most uterine myomata arise from dislocated myomatous elements connected with abnormally evolving "nests" of Wölfian and Müllerian structures. Thus their initial multiplicity may be accounted for.' There must also be a certain amount of truth in Broussais' doctrine of 'organic irritation and chronic inflammation,' which Virchow indorsed, giving the name of myomata to those fibroid tumours containing muscle-cells similar to those of the uterine wall.

Gottschalk, Keifer, Roesger, and Tridondani, also associate the origin of myomata with changes in the vessels of the uterus in their tortuosity, in the arrangement of the muscle fibres about the vessels, and in the enlarged muscular coats, in which muscular development the tumour is supposed to take its origin. Santi, however, believes that they arise from the uterine muscle fibres. The circular arrangement of the muscle fibres round the vessels does not accord with the longitudinal direction of the growth of the fibres of the myoma.

'Stanmore Bishop† has studied the vascular changes in myomata, and the effect of such changes on their development. He examined certain uteri from which fibroid growths had previously been removed; these uteri having been later excised for carcinoma of the cervix, he had sections made in order to see whether any vessels could be found in a later stage than those referred to above, in which the process of the formation of fibroid tumours might be studied.

'Cambernon, in 1844, suggested that an unfertilized ovum had found its way into the uterine tissue, and had been arrested in its passage. But this was only theory. Others, who depended more upon actual examination, found



FIG. 276.—SECTION OF FIBROMYOMATOUS UTERUS.

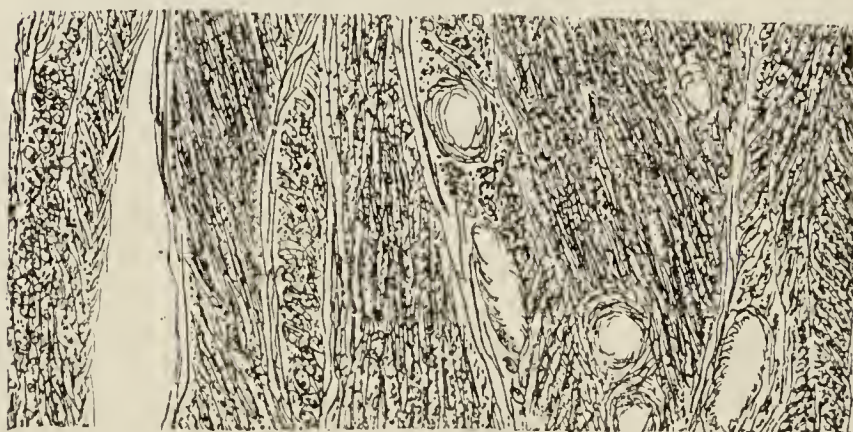
* 'The Pathology and Surgical Treatment of Uterine Tumours in the Nineteenth Century,' *Brit. Gyn. Jour.*, 1901.

† Stanmore Bishop on 'Changes in Fibromatous Uteri,' *Brit. Gyn. Jour.*, Feb., 1902.

epithelial relics, which Ricker believed were the remains of the primitive epithelium of Müller's duct. Max Voigt found glandular structures in certain



No. I., granules forming in the fibres.



No. II., corpuscular formation.



No. III., glands of the cervix and commencing suppuration.

FIG. 277.—SHOWING DEGENERATIVE CHANGES IN THE MUSCLE FIBRES OF A MYOMA. (FROM SECTIONS BY MARY DIXON JONES.)

inflammatory products; and Galippe and Landouzy described certain spherical cocci which initiated these inflammatory changes.

myomata. Hanser and Diesterweg traced these to Müller's duct; Nagel and Brens to the Wölffian duct. Meyer showed glandular structures in the muscular *uterine* tissue of newborn children, and also in that of adults. He also showed sections of adenoma clearly derived from the Wölffian duct. Klein demonstrated the remains of the same duct in the uterus of a new-born child.

'Although some growths may be found in which adenomatous tissue is present, the development of which may be explained in this way, such an explanation would not cover the great majority of fibroid growths which contain no such structures; and these have been variously interpreted. Thus, Virchow believed them to represent simply localized hyperplasia of previously existing muscular fibres; Lenn, the results of the development of a matrix of myoblasts, existing independently of pre-existing muscular fibres. Mary D. Jones considered that their starting-point was in in-

PLATE XXVIII.

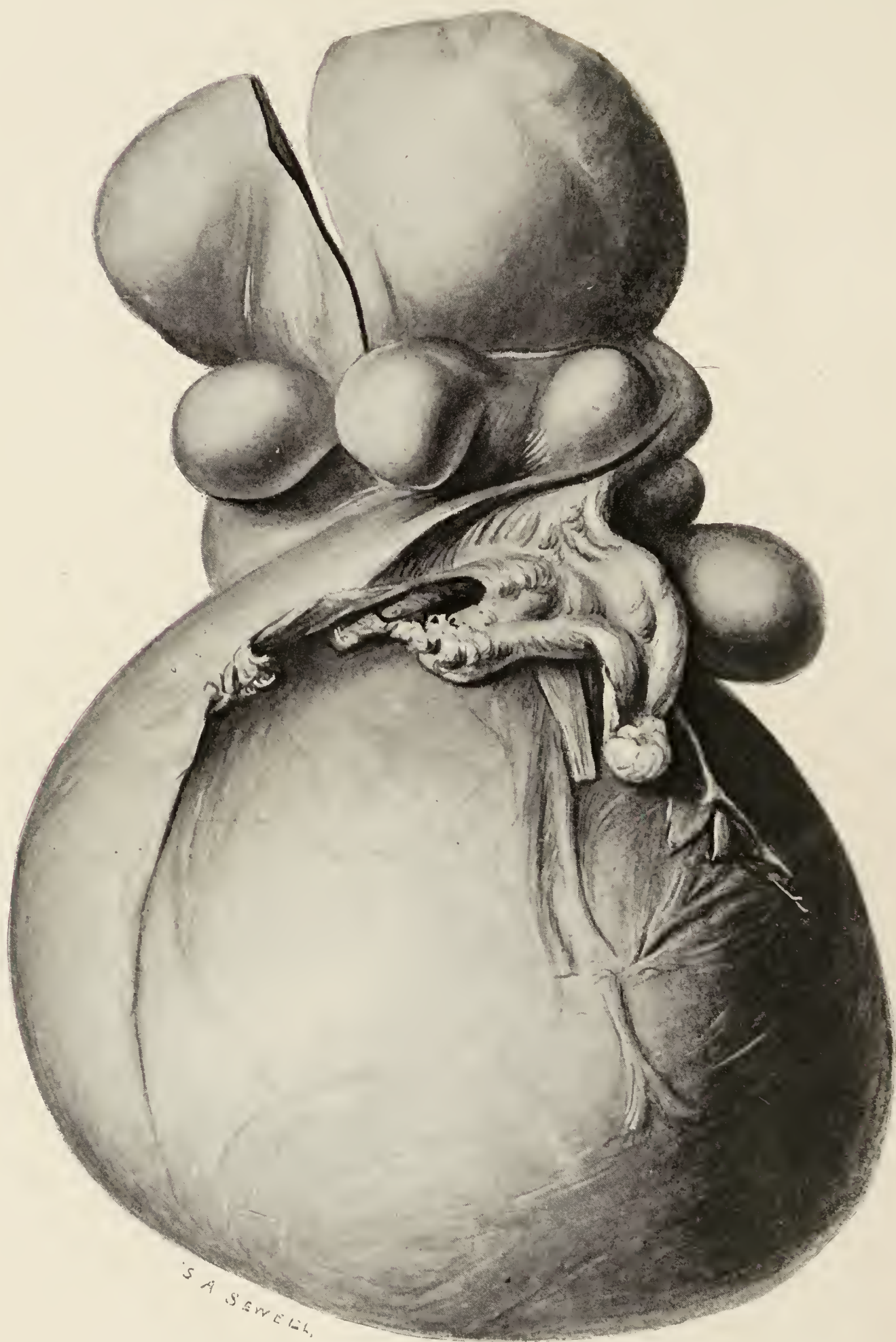


GIANT MULTIPLE MYOMA. (AUTHOR.)

Reduced to less than half-size. Dotted line A, A, marks the upper border of the abdominal portion. The mass above the line pushed up the diaphragm at the left side, causing dyspnœa and tachycardia. This was not discerned until operation. The lower mass filled the abdomen. Removed by supra-vaginal hysterectomy.

[To face p. 402.]

PLATE XXIX.



POSTERIOR SURFACE OF SAME TUMOUR. (AUTHOR.)

[To face p. 403.]



FIG. 277A.—SHOWING EARLY STAGES OF HYPERTROPHY OF THE ARTERIAL MEDIAN COAT. (STANMORE BISHOP.)

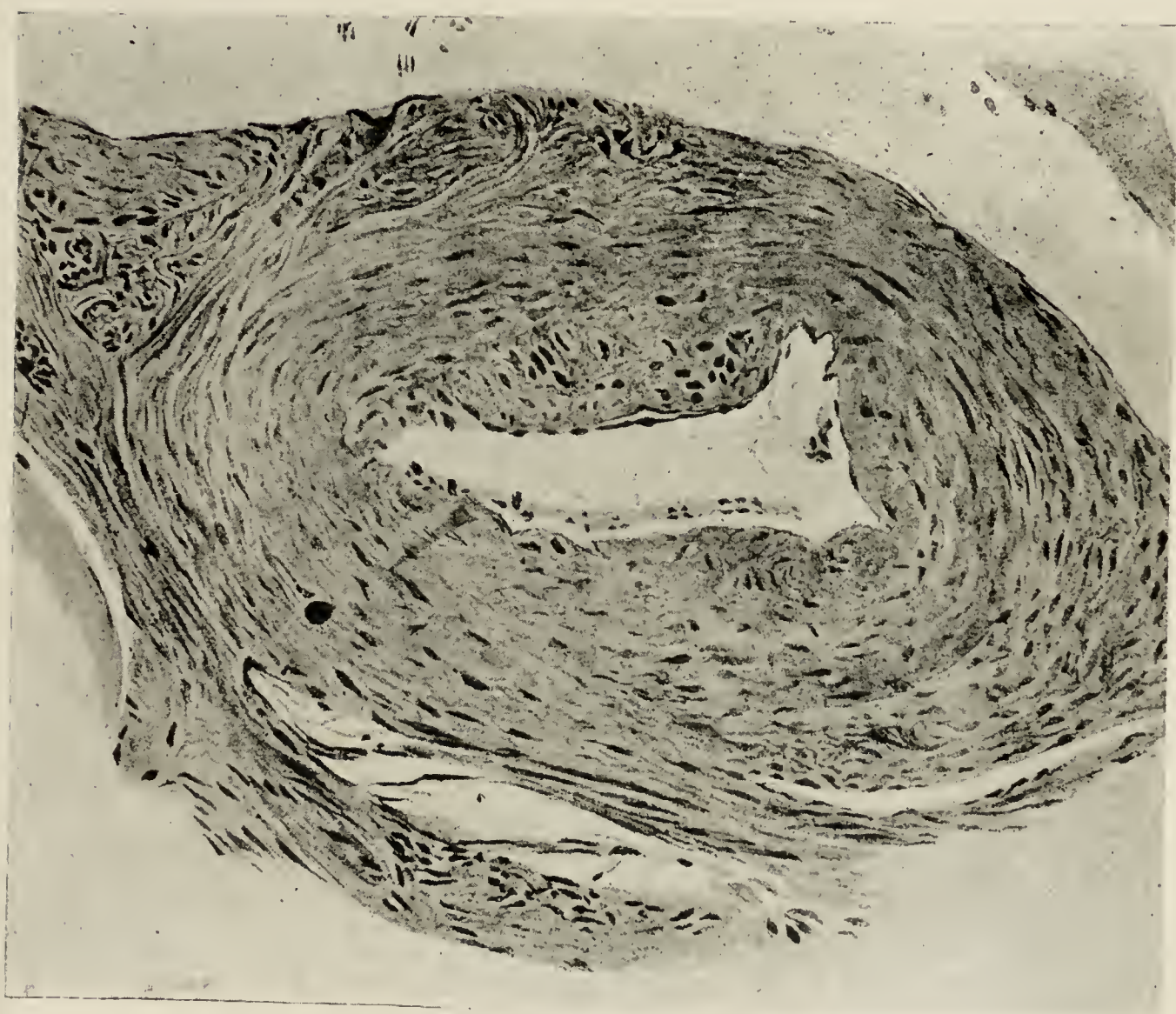


FIG. 277B.—CONSIDERABLE HYPERTROPHY OF MUSCULAR LAYER.
(STANMORE BISHOP.)

On the left, a mass of fibres are seen running longitudinally in the axis of the arterial lumen, within the circular fibres, but outside the intima.

[To face p. 402.]



FIG. 277c.—GROUP OF ARTERIES SHOWING VARIOUS STAGES OF HYPERTROPHY OF MUSCULAR LAYER. (STANMORE BISHOP.) [To face p. 403.]

‘Without hazarding any opinion as to the ultimate cause of fibroid growths, several writers have contented themselves with careful description of the appearances found in them, and this is at present the safest position. Especially has this been interesting in the case of the arterial supply of them. Roesger says that, as in the foetal uterus, the arteries affect the direction of the muscles, so it is in the case of the smallest myomata.

‘Kleinwachter described in the smallest myomata small bloodvessels just above the size of capillaries; these were surrounded by round cells, which change into spindle cells, finally resembling perfect organic bands of muscle fibre. Coster also described embryonic cells in the adventitia of similar vessels which developed into smooth muscular fibres. Pilliet, Klebs, Meslay, and Hyenne also describe this change. Pilliet says the endothelium of these arterioles remains normal: the adventitia gives origin to a zone of embryonic cells which multiply and develop into rows of concentrically placed smooth muscular fibres arranged around the vessel; the fibrous layers arise from the transformation of the most peripheral muscular layers which are furthest from the vessel, and are therefore furthest from the blood channel. Kleinwachter described these changes as occurring in the smallest arteries, Roesger in those possessing an adventitia, Gottschalk in the larger vessels. Müller disputes these observations.

‘The Figs. (Figs. 277A, 277B, and 277C) show the changes in the muscular walls of the vessels, in which the hypertrophy advances so far as to obliterate the lumen, producing also irregular thickening and tortuosity of the arteries, these drawings being taken from the muscular tissue of the uterus itself, and not from the neoplasm.’

Mary Dixon Jones regards the formation of a fibroid tumour as a consequence of granular and medullary change in the uterine tissue, this change commencing in the uterine fibres, and being consequent upon and associated with an inflammatory process and the development of corpuscles with granules. There is ultimate destruction of the muscle fibre, and a new formation.

Mode and Rapidity of Growth of Fibromyomata.

Mode of Growth.—Myomatous tumours are most variable in the *mode, direction, and rapidity of their growth*. In their mode, inasmuch as they may grow to a certain size and then either involute, atrophy, or generally shrink; or, having attained a given size, growth is quiescent for an indefinite time, when again the tumour puts on a phase of activity, and rapidly increases. In their direction, as nothing is more common than to find a tumour on a first examination occupying a defined position and relation to the uterus before it has emerged from the pelvis, and later on becoming irregular and assuming a lateral one; or the mass projects backwards, obliterating the pouch of Douglas, and compressing the rectum; or it grows anteriorly, displacing upwards the bladder and ureters; or develops downwards, and approaches the vaginal outlet.

Rapidity of Growth.—But in nothing does the development of a myoma vary more than in its rapidity of growth, and this is a matter of such common experience that it is unnecessary to dwell upon the fact. It seriously influences our prognosis, however, inasmuch as the tumour which may be borne with comparative comfort to-day may in a year's time, or even less, involve the bowel, causing obstruction; the bladder, resulting in incontinence; the kidney, by ureteral pressure; or affect locomotion, by pressure on the sciatic nerve. Myomata vary in consistence, as some are comparatively soft and compressible, others dense, and of stony hardness, depending much on the relative proportion of myomatous or fibromatous structure present.

In a paper on the 'Biology of Fibromyoma of the Uterus,' Ludwig Kleinwachter * discusses the development of the fibro-myoma.

The more muscular the tumours are, the more rapid, according to Gusserow, is the growth, which is also dependent upon changes in the blood supply or inflammatory processes. Menstruation frequently decreases the size of the tumour. Constriction of the pedicle, by causing œdema, is followed by increase. Protracted illness may bring about a decrease of the tumour, but the general result of his investigations would tend to show that the rapidity of growth varies considerably in different cases. Schorler thinks that the first evidences of the commencement of the growth of the tumour are not observable before three months. Kleinwachter draws the following conclusions:—

'No conditions in the growth of fibro-myoma of the uterus are sufficiently strongly marked and regular to enable one to determine the age of a tumour from its size. In the generality of cases the growth seems to be rapid—only in exceptional cases slow. Occasionally the growth appears to advance by leaps and bounds. After the tumour has increased very slowly for a considerable time, it suddenly increases with extreme rapidity, and in a few months attains an excessive size, unless pregnancy should intervene. It is only in exceptional cases that a tumour comes to a standstill in growth, or decreases in the pre-climacteric years. It appears as though ergotine treatment aided this result in isolated instances, but the same thing might have occurred without the use of this remedy. Wasting diseases seem here to play a part.

'Doubtless the original topographical position of the tumour or its covering is also a weighty factor in the case. Influencing circumstances should also be sought, as, for instance, whether newly-formed bloodvessels are taken into the tumour by way of the pseudo-membranes or not. In conclusion, inflammatory conditions of the periphery of the uterus, or inflammation of the deeper muscular tissues of the uterus, may both have an influence on the quicker or slower growth of the tumour.'

* *Zeitschrift f. Geburtshülfe und Gynäkologie* Trans. Brit. Gyn. Jour., Aug., 1895.

Varieties.—We may classify fibroid tumours of the uterus—(1) according to their pathological character : (2) their situation :

- (1) Fibroma.
 - Fibro-myoma.
 - Myo-sarcoma.
 - Adeno-myoma.
 - Fibro-myxoma.
 - Angio-myoma.
 - Cystic myo-sarcoma.
 - Myxo-sarcoma.
 - Adeno-myxo-sarcoma.
 - Cystic fibro-myoma.
- (2) Fibroid tumour of the cervix.
 - Fibroid tumour of the body.
 - Situation.
 - (a) Subperitoneal ; subserous.
 - (b) Submucous.
 - (c) Intra-mural ; parenchymatous.

Pozzi divides fibrous tumours of the uterus under three heads. He tabulates the three types as follows :—

- | | | | |
|---|---|--------------|-----------|
| I. Metritic (small interstitial myoma). | | | |
| II. Type developing toward the vagina. | <ul style="list-style-type: none"> A. Myoma of the intra-vaginal portion of the neck, sessile or pedunculated. B. Submucous fibromas of the body. C. Pedunculated fibromas of the body, or polypi, these latter being (1) intra-uterine or (2) intermittent in appearance, protruding from the uterus at the time of the catamenia and retreating in the intervals ; and (3) intra-vaginal. | | |
| III. Type developing toward the abdominal cavity (subperitoneal or interstitial). | <ul style="list-style-type: none"> A. Pedunculated fibromas. B. Sessile fibromas, not including those in the broad ligaments. C. Sessile fibromas, included in the broad ligaments. <table border="0" style="display: inline-table; vertical-align: middle;"> <tr> <td style="padding: 0 10px;">} Abdominal.</td> </tr> <tr> <td style="padding: 0 10px;">} Pelvic.</td> </tr> </table> | } Abdominal. | } Pelvic. |
| } Abdominal. | | | |
| } Pelvic. | | | |

Subperitoneal tumours are attached to the wall of the uterus either by a pedicle or by a broad base. The tumour pushes the peritoneum before it. It may become detached from the uterus, or remain attached to it by a long pedicle composed of peritoneum and connective tissue. The submucous grows into the uterine cavity. If it be pedunculated, it is known as *fibrous polypus*. If parenchymatous, it may be *single* or *conglomerate*, encapsuled or

non-encapsuled. The conglomerate may be formed by the fusion of a number of small fibroid masses, which give to the tumour a lobulated appearance. They may lie in a capsule of cellular tissue, or they may be simple outgrowths from the uterine wall, and continuous with and devoid of any capsular investment.

Degenerations.—Though in the last edition of this work I referred specially to degenerative changes in myomata, the subject has been more fully discussed within the last few years, and evidence has accumulated to prove that such degenerations are far more frequent than was previously thought.

This classification of degenerations and complications of myomata is complete, so far as our present knowledge enables us to say.

Degenerative Complications.

(a) Degenerative changes in the tumour. . .	{	Mucoid.
		Colloid.
		Calcareous.
		Sarcomatous.
		Suppurative.
		Gangrenous.
		Necrobiotic.
		Telangiectatic.
		Adeno-carcinomatous.
		Adiposis.

Extra-uterine Complications.

(b) Adnexal complications .	{	Inflammatory and adhesive.
		Suppurative.
		Tubercle.
		Cystic.
		Solid benign growths.
		Solid malignant growths.
(c) Bowel complications .	{	Obstruction. Appendical.
		Adhesions { Omental.
		Intestinal
(d) Peritoneal complications .	{	Peritonitis { Pelvic { Acute.
		General { Subacute.
		Septic.
		Ascites.

(e) Vesical, renal, and ureteral complications . . .	Displacement of the bladder and ureters. Adhesions. Obstruction of ureter. Hydro-ureter. Hydronephrosis. Pyonephrosis. Albuminuria.
(f) Circulatory complications	Hæmorrhage. Anæmia, Cardiac complications.
(g) Those arising from pregnancy	Abortion. Miscarriage. Ectopic gestation. Rupture of the uterus. Malpresentations. Dystocia. Obstructed labour. Postpartum hæmorrhage.

Psychical Complications.

(h) Mental effects	The disorder of mentalization may vary in degree, from the neurasthenic or hysterical state to phases of melancholia, dementia, or mania.
(i) General consequences	Under this head we may include such consequences of pressure, as difficulty in walking; inflammatory changes in the tumour due to exposure or traumatism; interference with health, consequent upon pain, weight of tumour, constipation, urinary disturbance, and the depression and apprehension caused by the presence of the tumour.

Torsion of the Uterus.—This is comparatively a rare condition. Ehrendorfer ascribes it to the resistance offered to the growth of the tumour caused by the obstruction from the pelvic wall. The presence of an ovarian tumour predisposes to it, still more so if the ovarian tumour be associated with pregnancy. The ovaries are also frequently displaced, and out of position. Torsion gives rise to such complications as congestion and fibromitis, necrosis of the tumour, and peritonitis.

Degenerations.—In the *Edinburgh Medical Journal* of 1900, I discussed the subject of myoma and its degenerations, and the bearing of the latter on the question of operation, side by side with the complications mentioned in the text. The degenerative changes I then summarized were those given in the table, p. 406.

At the meeting of the British Gynæcological Society (July 11, 1901) I collected the following examples of degenerative changes in myoma :—Cystic degenerations, 10; myxomatous (mucoid), 2; necrobiotic, 4; calcareous, 5; cystic adenoma, 1; telangiectasis, 1; suppuration, 2; malignant ‘soft adenomatous’ (?), 3; carcinomatous, 2. These specimens were exhibited, at my request, by William Duncan, Handfield Jones, Mayo Robson, the Master of the Rotunda (Purefoy), Charles Ryall, B. Jessett, Mary Scharlieb, A. Giles, Cheatle, and Stanley Boyd.

At that time I had the museums of the large London hospitals, and that of the College of Surgeons, searched for examples of degeneration, with the following results :—

In the Museum of the Royal College of Surgeons of England there were in all 47 specimens marked definitely as fibrous tumours of the uterus. Of these, 33 are described as having undergone ulceration, degeneration, or been complicated by adhesions, pregnancy, or ovarian tumours. These we may divide as follows :—Pressure of ureters, 1; ulceration of the tumour, 3; ulceration of the vagina, 1; calcification, 3; cystic degeneration, 1; with complications of the adnexa, 6; with pregnancy, 5.

In St. Bartholomew’s Hospital Museum there were examples of the following degeneration and complications :—Cystic degeneration, 3; calcification, 2; myoma complicated with diseases of the adnexa, 5; myoma with cancer, 1; degenerating myoma with cavity containing serous fluid, 1.

In University College Hospital Museum there were the following :—sloughing myoma, 1; fungoid degeneration with ulceration, 1; suppurating myoma with calcareous degeneration, 1; calcareous degeneration with adnexal complications, 2; calcareous degeneration alone, 5.

In the Westminster Hospital Museum there was one specimen of calcareous degeneration. In St. George’s Hospital Museum there are 4 specimens of calcareous degeneration of myoma, 2 of myoma complicated with pregnancy, 1 of myxomatous degeneration, and 1 of fibro-cystic degeneration.

On this search I commented—

‘The search in the various museums establishes the contention that discussions on the surgical treatment of myoma of the uterus have been in a sense hitherto conducted in the dark; countless specimens have been exhibited without any pathological examination having been made, in many instances

not even cut open—exhibited as evidences of surgical skill and triumph, and often not even of the latter. The day has gone by for the presentation of a tumour, no matter what its size, unless its pathological significance be at the same time illustrated and exposed.'

Charles Noble (who read a paper on the subject) recorded the results of the examination of 218 cases of fibro-myomas. He found as a result that about one-third would have died from the complications or degenerations present. He also arrived at these conclusions:—The disappearance of the myoma as a result of the menopause is not to be expected. Adhesions, anæmia, thrombus, phlebitis, and sarcomatous degeneration are special dangers. While the mortality from hysterectomy is 2–10 per cent., that arising from the tumour is some 33·3 per cent. He has since* again revised the subject of 'the risks encountered by patients suffering from fibroid tumours,' whether those of a fatal nature or threatening life, or those which involve invalidism. He gives the presumptive mortality from complications and degenerations from an analysis of 688 cases of fibro-myomata recorded by Martin, Noble, Frederik, and Cullingworth, at 16–24 per cent. arising from the tumour itself, and some 45 per cent. if we include extra-uterine complications which were present.†

Prochownick‡ says that, upon investigating all the cases of uterine myomata that he had met with in the course of the last twenty-five years, he had found that, even with the most careful and painstaking conservative treatment, barely three-fifths of the sufferers had been conducted past their climacteric, and then remained permanently cured. In the other two-fifths, operation became a matter of necessity, in many after the normal, in some after an artificial, menopause; of 32 castrated women, 9 had to undergo a subsequent operation. At the same time, he declared that the indications for interference were to be deduced from persistent study of the anatomy of these tumours and from clinical observation, aided by all modern means of research, and not from the improved technic and better prognosis of operation.

He enumerated and illustrated by specimens the following kinds of degeneration:—

1. Simple systemic degeneration without alteration of the morphological structure of the tumour; due entirely to the clinical effects of the growth, generally to the hæmorrhage (anæmia, hydræmia, heart affections), less frequently to pressure or tension (bladder, ureters, kidneys).

2. Degeneration of the tumour:

- (a) Innocent and relatively normal changes—atrophy, calcification, adiposis.

- (b) Degenerations anatomically innocent, but clinically malignant.

* *American Gynecology*, April, 1903.

† In quoting Boldt, Montgomery, and Kelly, Noble says: 'So far as text-books are concerned, the classical teaching about fibro-myomata is still perpetuated, viz. that these tumours are benign in character, that they usually produce no symptoms, that their chief danger consists in their tendency to produce hæmorrhage, and that after the menopause they tend "to shrink and disappear." I must here enter a protest, for this is just the opposite of that enforced in the eighth edition of this work.

‡ *Münch. m. Wehns.*, 1901, No. 19.

Of these latter a considerable number are originally due to the clinical effects of the tumour before it has undergone any change (alteration in the composition of the blood from hæmorrhage). Acute forms are uncommon (torsions, thromboses, hæmorrhagic infarcts, accidental infection or gangrene, generally due to therapeutic measures). Sub-acute forms are not so rare (necrobioses, which clinically and anatomically are analogous to a dead foetus). Chronic forms are more often seen (fibrinous, myxomatous and cystic degeneration). Telangiectatic and mechanically inflamed myomata (with or without chronic infection) also belong to this category.

(c) Degenerations anatomically malignant.

Proehowniek held that, when associated with myoma, sarcoma is due to metaplasia,* carcinoma to invasion from without.

Clinically, a distinction must be made between the degenerations which occur before and after the menopause; the latter are always more serious and of more unfavourable prognosis, and operation, if to be done at all, should be done early.

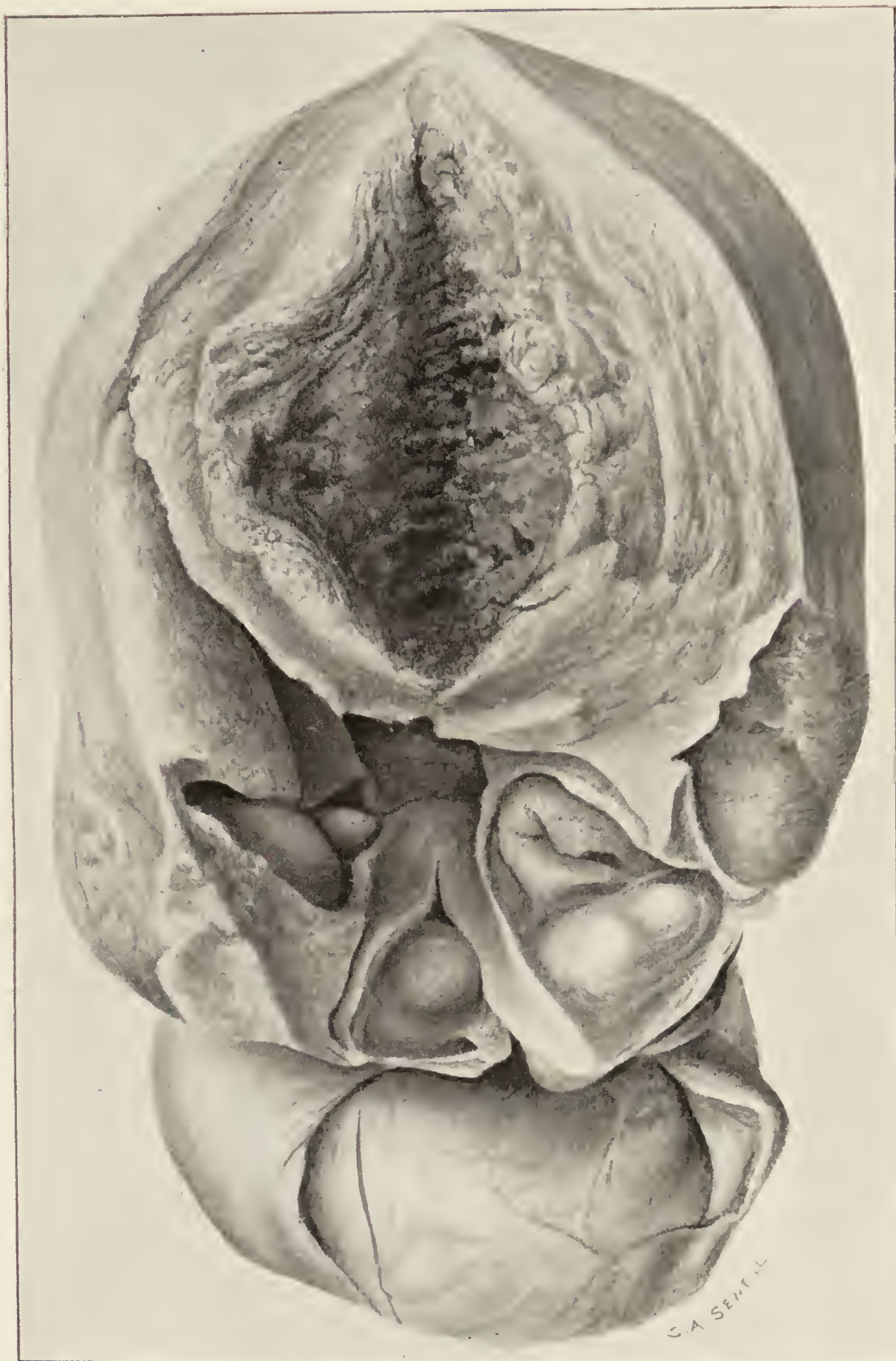
The gradual progress of systemic degeneration can be accurately observed by repeated examination of the blood (estimation of the hæmoglobin before and after the menstrual flow, enumeration of the red corpuscles, leucocytosis, and charting the hæmorrhage curve). A decrease of the hæmoglobin below 65 or 60 per cent., or of the red corpuscles below 2,500,000 without recovery in the interval, is an urgent indication for interference, as also is a slow but steady fall in the number of red corpuscles with a constantly decreasing recovery between the bleedings.

In morphological degeneration also, even if the patients do not suffer from very serious hæmorrhage, regular examinations of the blood are of much clinical importance; a slow fall in the figures, and alterations in the leucocytes, accompany all chronic changes in the tumours.

As points to which special attention should be directed, Proehownick instanced—the seat and number of the tumours and their arrangement in and about the corpus uteri; their growth and consistence, any sudden or rapid enlargement being very ominous; any change in the type of the catamenia; pains, which at their onset are generally due to tension upon the parietal peritoneum, and then always suggest the presence of some inflammation; the urine—a specimen taken with the catheter—should be examined frequently, renal irritation almost invariably occurring early in anatomical changes, even in those at first innocent. Alteration in the shape of the heart and in the quality of the pulse are associated with every form of degeneration; and the weight and specific heat of the body, the fundus of the eye, the facial expression, the condition of the skin, and the appearance of ascites are not to be neglected. Degeneration of a myoma is not, any more than other malady, betrayed by one symptom, but by the concurrence of several.

* **Hæmangio-endothelioma Intravascular.**—A mass weighing fifteen pounds has been removed from the neck of the uterus, the microscopical appearances of which showed that it originated from the epithelium of the vessels of the uterine wall. In structure it closely resembled sarcoma, but there were no metastases. (*Virchow Archiv.*, bd. clxxi., heft i.)

PLATE XXX.



DUAL MYOMA OF THE UTERUS—NECROBIOSIS AND MUCOID WITH CALCAREOUS
DEGENERATION. (AUTHOR.)

There were no urgent symptoms. The patient was otherwise in good health, but the tumour was perceptibly increasing in size. Operation was decided upon, and supra-vaginal hysterectomy performed. On section, a considerable necrotic area was found in the upper myoma bounded by a zone of calcareous degeneration, and the canal of the uterus greatly enlarged and full of mucoid fluid.

[To face p. 410.]

Frankel confirmed the results of Prochownick's investigations from his own experience in the post-mortem room.*

Fibro-cystic Tumours—Etiology.†

Mary Dixon Jones has recently written on the etiology of fibro-cystic tumours of the uterus.‡ As we have already shown, cystic degeneration is not an uncommon sequence of a myomatous growth in the uterus, but cases in which large cysts are found in a myomatous tumour are comparatively rare. This was the experience of such operators as Pean, Spencer Wells, and Clay. Individual cases have been reported from time to time, and several in which the tumour was mistaken for ovarian cystoma, as many as thirty pints of fluid being contained in the cyst.§ Skene Keith recently showed, at the British Gynæcological Society, a huge fibro-cyst. The tumour weighed 36 lbs., and was taken from a single woman æt. 30. Mr. Keith had seen her ten years previously. The tumour was then small, and it was decided not to interfere. With the cessation of menstruation, the tumour decreased in size, and then remained stationary until eighteen months before the operation, when it began to increase rapidly, until it attained to the size mentioned. There was no microscopical examination in this case, but, when the tumour was cut into, it consisted almost entirely of one enormous cystic cavity full of broken-down *débris* in mucoid fluid.

Another such case was reported by Worrall of Sydney, in which the cystic myoma weighed 38 lbs. The patient from whom it was removed was æt. 42, and the cavity contained some 2 gallons of dark brown fluid, in which floated great ropes of disintegrating fibro-muscular tissue. In this instance the tumour appeared to have been growing for nine years, but the great increase in size had occurred within the last eighteen months. In many the cystic degeneration was mingled with calcareous and suppurative changes. Mary Dixon Jones, who so far back as 1886 was studying the nature of these tumours, quotes the view of Pean,¶ that the cyst may be due to (1) the deliquescence of a portion of a fibroma, or (2) the dilatation of the lymphatics and the formation of sinuses at the extremities of the several vessels. The first of these views was accepted by Virchow. Klebe attributed them to hydropsia and œdema. The view of lymphatic dilatation was advocated by Bilroth and Koeberle, the lymphangeomatous nature of the tumour lending force to the supposition, as also the rich peripheral supply of lymphatics. The authoress does not accept this explanation, and she regards the new cystic

* At a meeting of the British Medical Association at Ipswich, in 1900, Harrison Cripps referred to the frequency with which cystic and mucoid degeneration occurred in myomatous tumours of the uterus, and I then urged the need for recognition of the special dangers arising out of these and other degenerative changes.

† See also p. 432 for differentiation.

‡ *Med. Rec.*, Oct. 10, 1903.

§ *Dub. Quart. Jour.*, Aug. 1, 1864.

¶ 'Pathology of Tumours,' vol. iii., p. 399.

formations as a consequence of medullary changes in the tissues and new formations eventuating from this medullary condition. The cyst is a develop-

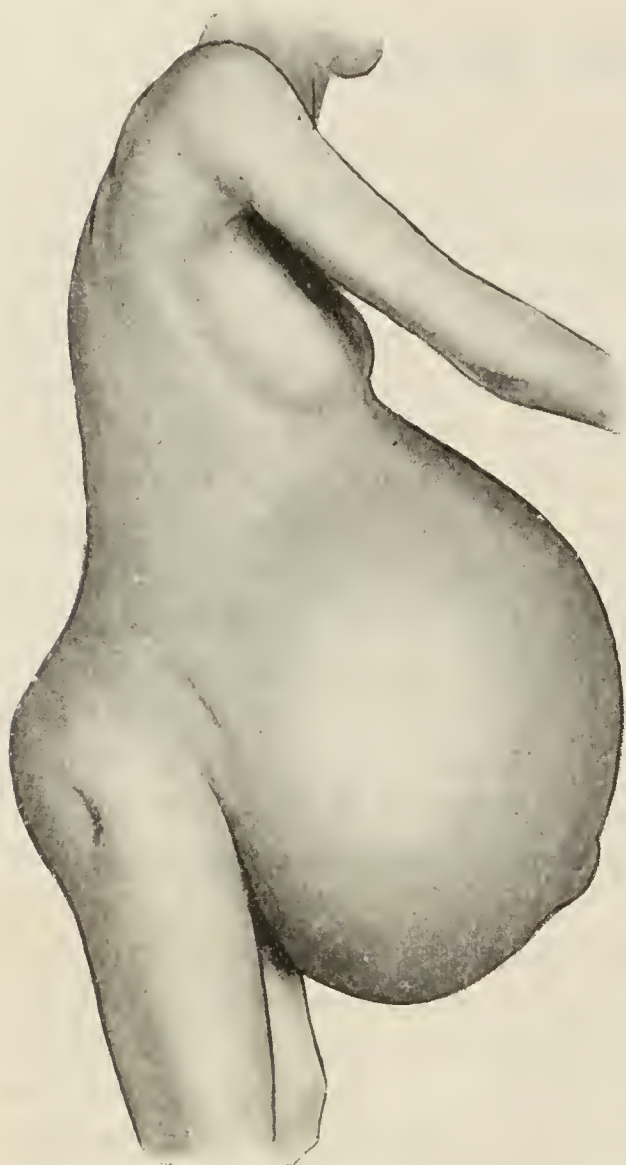


FIG. 278.—GIANT CYSTIC FIBRO-MYOMATA OF UTERUS, WEIGHING EIGHTY-SEVEN POUNDS, ABOUT HALF THE ENTIRE BODY WEIGHT REMOVED SUCCESSFULLY FROM A PATIENT, AGED FORTY-ONE YEARS. (CLARENCE WEBSTER, CHICAGO.*)

The operation lasted two hours and a half, was conducted with the woman in an analgæsic condition (partial anæsthesia with the Schleich mixture in the skin) and heat maintained by the electric pad.

sarcoma. David Finley recorded such a case before the Pathological Society of London, in which the tumour was encapsuled, as is the case in uterine myoma. This patient had noticed a hard swelling in the abdomen for fifteen years before the rapid increase occurred that called for interference.' †

Alban Doran discussed the entire question, and exhibited a tumour in which

ment from the medullary material. She takes the view that a fibroid tumour is a diseased condition arising out of an inflammatory corpuscular change in the tissues of the uterus; that fibroid tumours do not cause degeneration, but that degeneration arises from the secondary processes of disease developed in the tumour or in the uterus; and, further, that infection of the adnexa is carried from the tumour to the ovaries and tube. She supports her contention by a number of microscopical researches into the nature of the fibro-cystic degeneration, in which she found inflammatory changes in the tissues with the presence of granules and inflammatory corpuscles, sometimes osseous degeneration, another time pus, these being associated with sinuous cystic canals or irregular cavities. In some the changes partook of the endotheliomatous nature, and blood cysts were present. The granules present were derived from the inflammatory corpuscles which in their turn were developed from a metamorphosis in the normal tissue.

The important question, whether *myoma* of the uterus may degenerate into a sarcoma, must be answered in the affirmative (see chapter on Cancer). Virchow, Schröder, and Martin (not to mention many others) believe that such a metamorphosis does occur. In fact, it is regarded by some as the rule in cases of

* *Jour. Obst. and Gyn. Brit. Emp.*, Aug., 1903.

† *Trans. Path. Soc.*, vol. xxix., 1883, p. 177.

PLATE XXXI.



LARGE MULTIPLE MYOMA ($\frac{1}{3}$ natural size) REMOVED FROM PATIENT, AGED 54, SUFFERING FROM PROFOUND ANÆMIA CAUSED BY VIOLENT HÆMORRHAGE DURING THE CLIMACTERIC SUPRA-VAGINAL HYSTERECTOMY. (AUTHOR.)

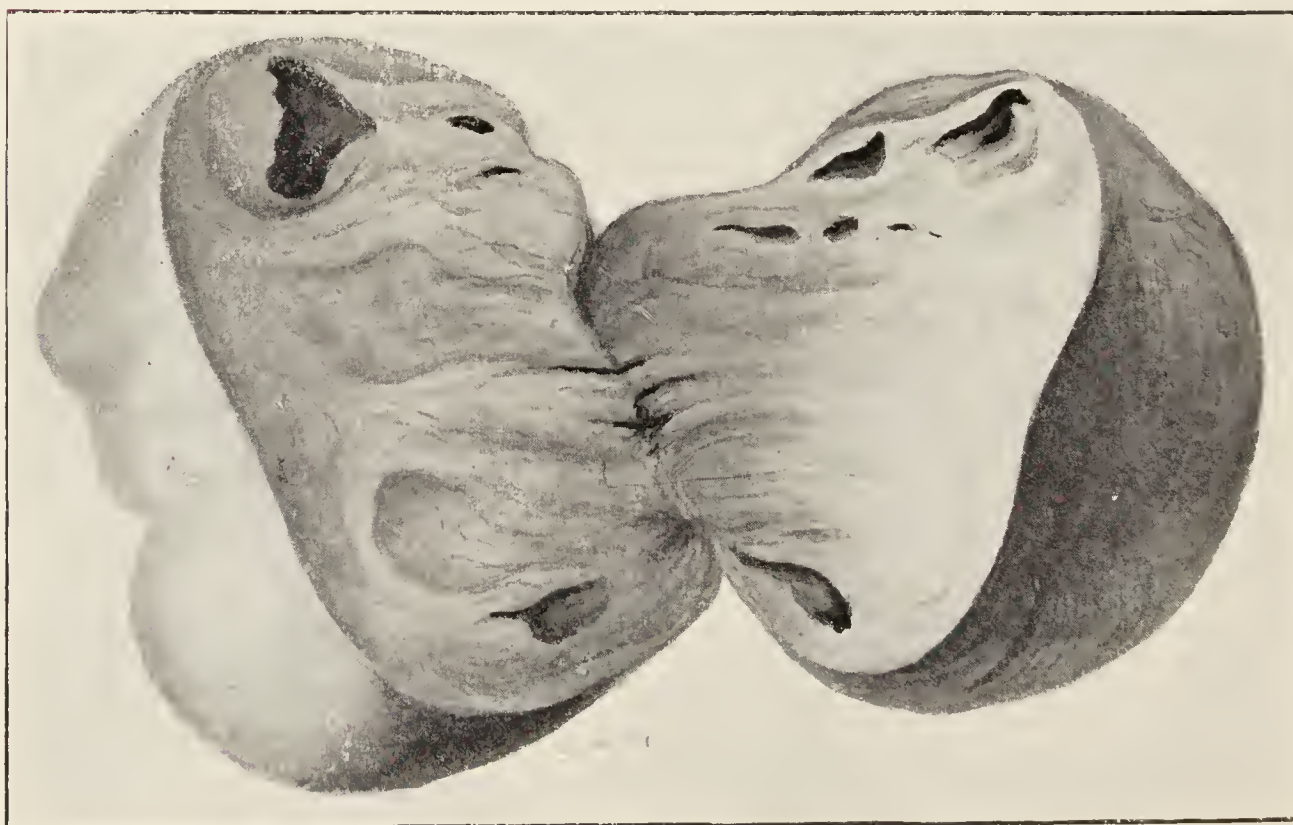
There was a large central cavity filled with mucoid fluid. Recovery. [*To face p. 412.*]

PLATE XXXII.



CYSTO-SARCOMA OF THE UTERUS, WITH ASSOCIATED NECROBIOTIC AND MUCOID DEGENERATION SURROUNDED BY THE MUSCULAR STRUCTURE OF THE UTERUS. (W. B. JESSETT.)

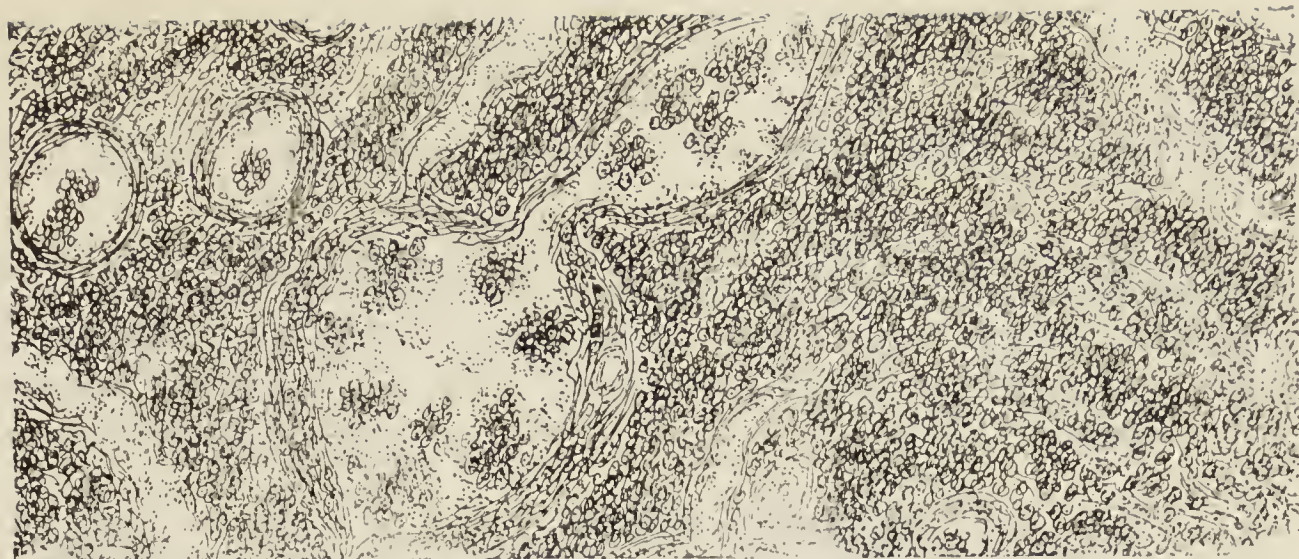
PLATE XXXIII.



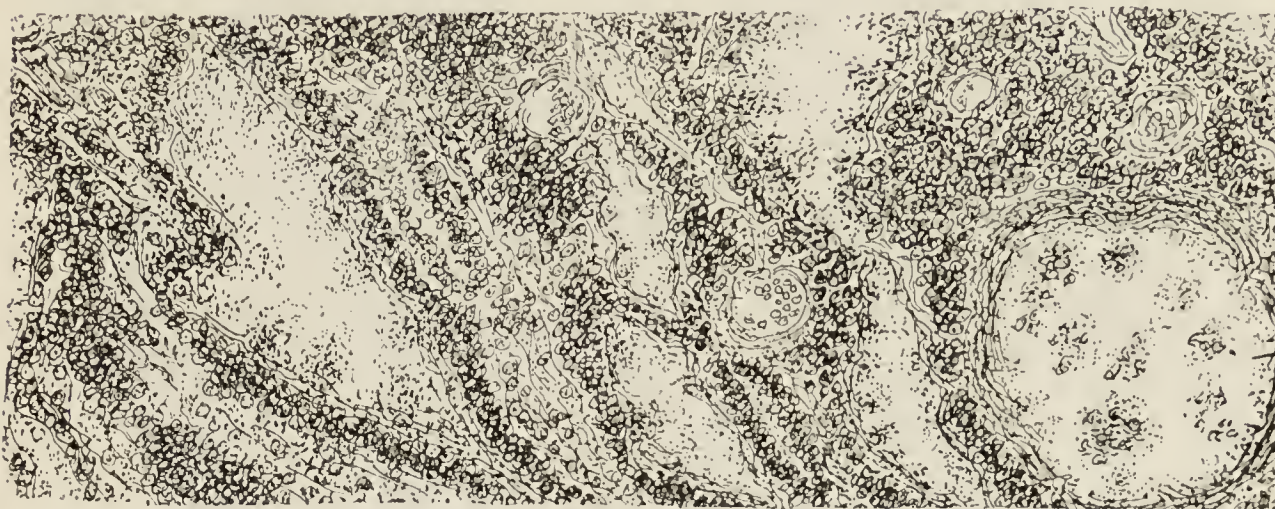
SUBSEROUS FIBROID OF UTERUS WITH MYXOMATOUS DEGENERATION. (AUTHOR.)

The entire substance of the tumour was converted into myxomatous tissue, with cavities here and there filled with mucoid fluid.

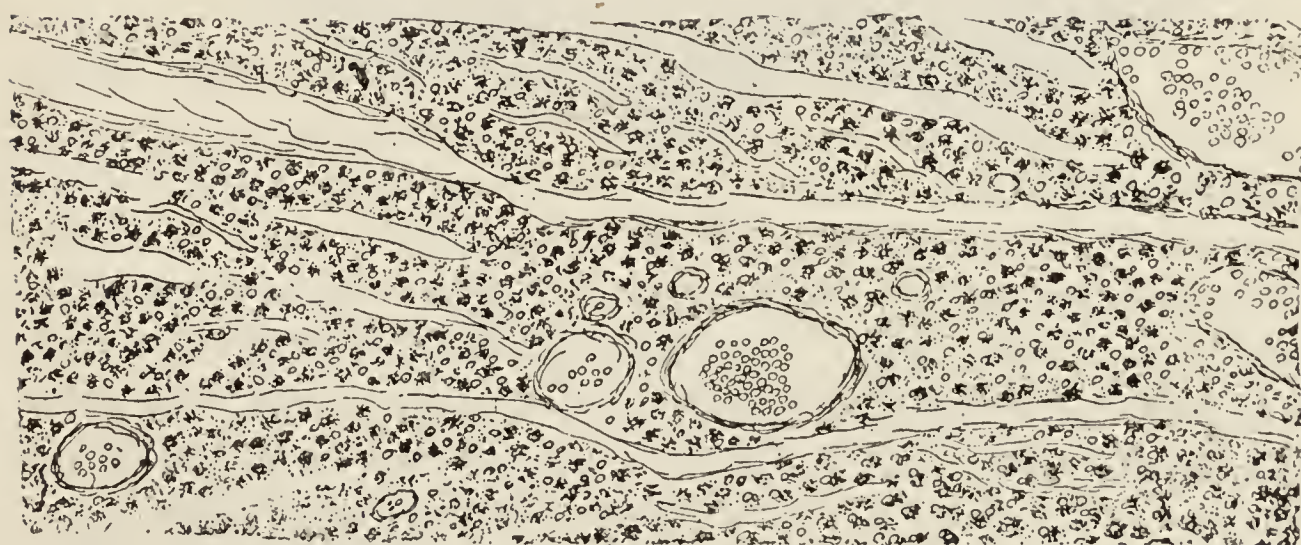
[To face p. 413.]



No. I. showing inflammatory area, fibro-cystic formation, and bloodvessels.



No. II. showing fibro-cystic formation with inflammatory corpuscular areas.



No. III., showing granules from inflammatory corpuscles with some blood corpuscles, canal cysts, and blood cysts.



No. IV., showing the same granules, canals, and blood cysts.

FIG. 279.—SECTIONS FROM FIBRO-CYSTIC MYOMA. (MARY DIXON JONES.)

such transitional changes appeared to be occurring at the time of removal:—

‘The tumour was practically an expansion of the fundus, lying in its walls, which thus formed the capsule. Elsewhere the uterine walls were soft and very thick, entirely free from interstitial fibroids. Thus the tumour was solitary. A phlebolith, in appearance like an oval, semi-transparent, yellow pebble, one-eighth of an inch long, lay under the serous coat of the uterus

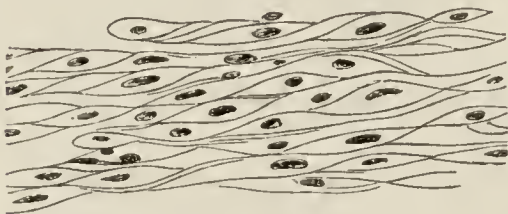


FIG. 280.—SECTION OF THE TUMOUR, SHOWING BUNDLES OF WELL-FORMED PLAIN MUSCLE-CELLS. ($\frac{1}{8}$ " objective.)



FIG. 281.—ANOTHER PART OF SAME SECTION, SHOWING SHORTER FUSIFORM CELLS WITH LARGE OVAL NUCLEI.

posteriorly. Pure fibrous tissue was practically absent. Uterine muscle-cells abounded. They formed thick bundles, and each cell was very elongated, and bore a long, narrow (“staff-shaped”) nucleus. Groups of cells of a different type were also present. They were quite as distinct as the muscle-cells, but shorter and much thicker. The nuclei were distinctly oval and wide in the middle. The two varieties of cell above described are represented in the drawings.’*

From a number of sources have come, within recent years, authentic reports of this transition of uterine neoplasms into sarcomatous tissue. A typical case was reported by Goffe † where a symmetrical tumour, four pounds in weight, was found infiltrated with fibro-sarcomatous tissue and a necrotic sarcomatous mass filling the uterine cavity. Edge and Christopher Martin met with four cases of sarcomatous degeneration of myoma, and Doyen and Schauta have also recorded several cases of sarcomatous and malignant degeneration in the cervix after supra-vaginal hysterectomy.

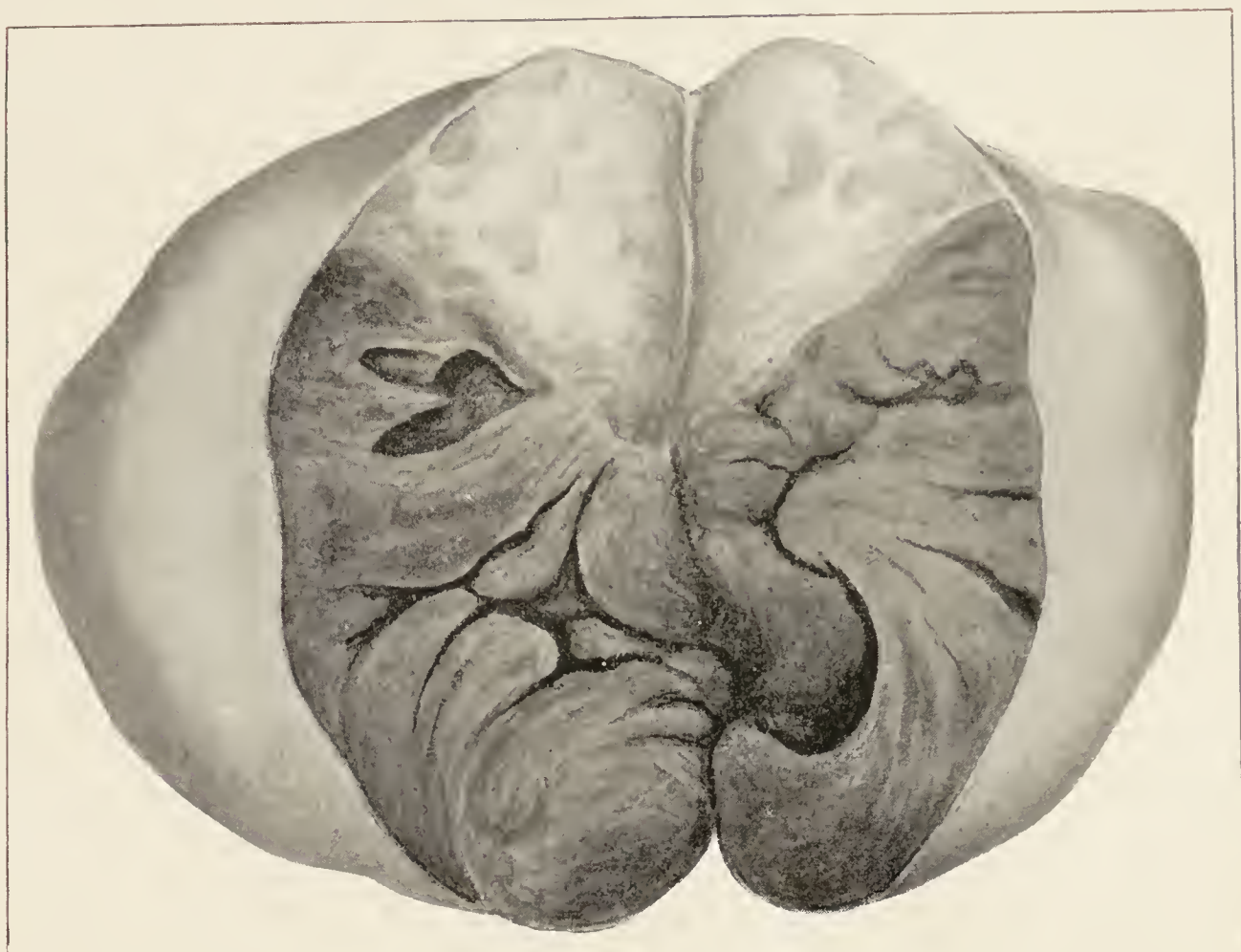
Jessett says: ‘With respect to myomata taking on sarcomatous growth, there can be no doubt.’ He has had six or seven such cases. (See Plate XXXIV.)

That malignant degeneration may arise in the uterine tissue, is proved by the number of cases of sarcoma and carcinoma occurring in the uterine stump remaining after supra-vaginal hysterectomy. Before 1901 forty such cases had been recorded by the following operators alone—Schauta, Schenk, Menge, Doyen, Wehmer, Flatau,

* *Trans. Path. Soc.*, 1890.

† *Amer. Jour. Obstet.*, April, 1902.

PLATE XXXIV.



TELANGIECTATIC MYOMA. (PUREFOY.)

Patient, aged 52, unmarried; had severe attack of peritonitis, lasting 6 weeks; large abdominal tumour discovered while under treatment; was operated upon at the Rotunda Hospital. There were numerous omental adhesions, the separation of which caused much hæmorrhage. The abdominal wall was firmly incorporated with the anterior surface of a large fibroid, connected with the left cornu of the uterus by a small pedicle.

On section, the substance of the tumour, except a small portion near the pedicle, was found to be of a dark red colour, and was hollowed out into large cavities freely communicating and containing unaltered blood in large quantities. Dr. Earle reported as follows on the microscopical appearances:—‘The tissues of the tumour, though so unusual in colour, did not show degenerative changes, but stained in the usual way, and the numerous cavities having a very smooth lining membrane appeared to be dilated bloodvessels.’ This condition in a myoma is of great rarity, and very few instances of it have as yet been reported in this country.

[To face p. 414.]

PLATE XXXV.



SECTION OF PORTION OF MYOMA, SHOWING CENTRAL AREA OF CALCIFICATION,
THE RESULT OF HYALINE DEGENERATION.

The tumour removed by myo-hysterectomy, showed in section a central area of calcification, in the centre of which was a small calcified mass. Within a hyaline patch some thick-walled vessels containing organized blood-clot are seen. A hard nodule from another part of the growth has been decalcified and examined. It shows that the calcareous deposit has been laid down in parts of the fibroid which have previously undergone the hyaline change above referred to. Such hyaline degeneration is likewise associated with the calcification present in some forms of carcinoma.

PLATE XXXVI.



AREA OF HYALINE DEGENERATION, WITH PROCESS OF CALCIFICATION
PROCEEDING.

[To face p. 415.]

Jacobs, Saver, Christopher Martin, and Edge.* Flatau, out of 104 cases of myomata, under his charge, found that five had undergone sarcomatous degeneration.† He is of opinion that the sarcoma is developed from the cells of the connective tissue stroma. In none of his specimens did he find the transition of normal myocytes into sarcoma cells, of various size and colour with irregular nuclear forms in myoblasts. Carcinomatous degeneration of myomata he considers is due to growth of the epithelial mucosa into the myoma, or by proliferation of epithelial elements of misplaced fragments of organs. Malignant degeneration he does not think has any special influence on the indications for operation.

Adeno-myoma.—Out of an examination of seven hundred cases of uterine myoma Cullen‡ found nineteen specimens of adeno-

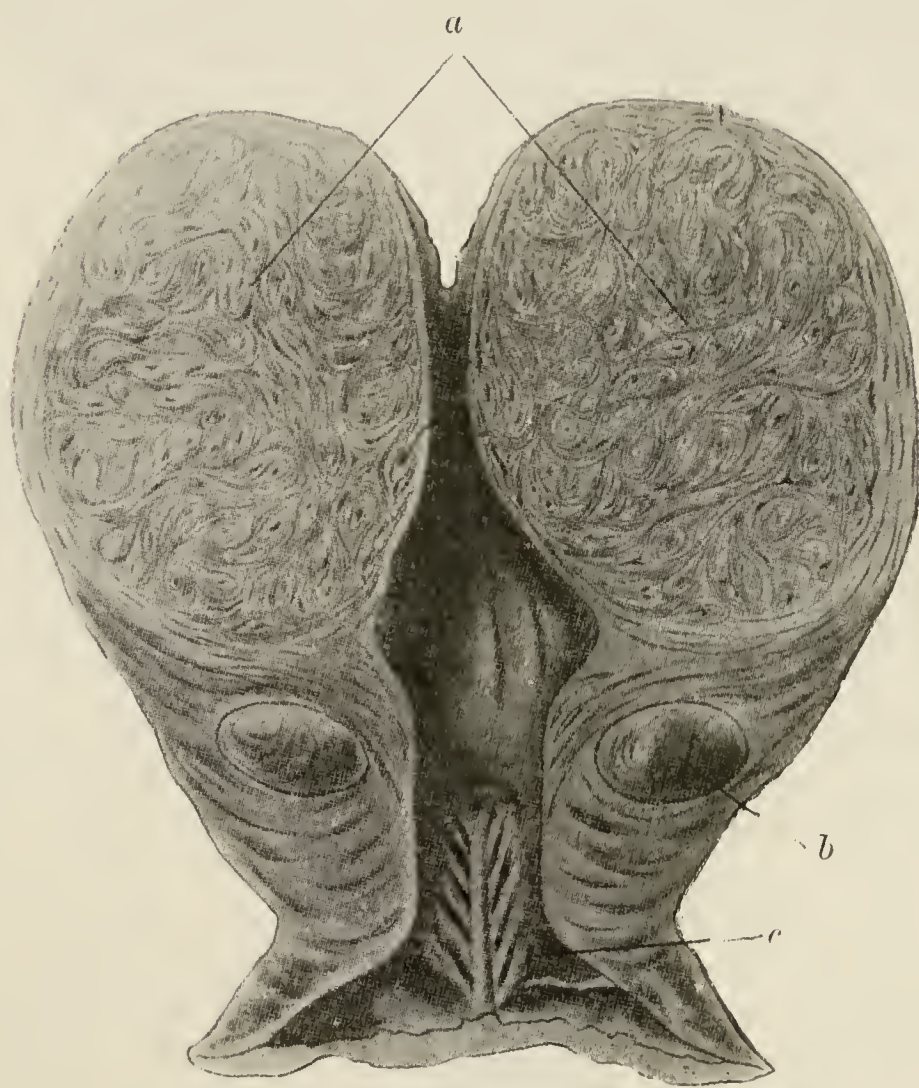


FIG. 282.—ADENOMA OF THE UTERUS. (LANDAU.)

a, adenoma of body; *b*, fibromatous nodule; *c*, cervix.

myoma. The condition is most frequently met with during the child-bearing period. Cullen leans to the view that this neoplasm

* *Brit. Gyn. Jour.*, May, 1901.

† *Münch. m. Wchns.*, 1901, No. 14.

‡ *Amer. Med. Jour.*, July 5, 1902.

is not due to remains of the Wölfian duct, but to the uterine mucosa or a portion of Müller's duct. The uterine mucosa extends by continuity into the neoplasm; while here are found glands resembling uterine glands in a characteristic stroma, the Wölfian body contains no structures that can be mistaken for uterine glands. Cullen divides the growth into three main groups. (1) The uterus is as a rule enlarged, more globular in shape, or somewhat irregular in outline from small superficial myomata. There is a tendency to fixation of the uterus from adnexal and peri-uterine adhesions. Profuse menstruation is a consequence. The other two groups are (2) the subperitoneal or intra-ligamentary; and (3) the sub-mucous. The differentiation of all these growths from simple myoma, or a sarcoma, is extremely difficult, if not impossible, before removal.

Fig. 284 is taken from a specimen of Leopold Landau's. The case was diagnosed as one of myoma. At operation both appendages were found diseased, at the left side there being a tubo-ovarian blood cyst, with a hypertrophied and convoluted tube, the ovary being papillomatous, and on the right side a hæmato-salpinx 14 cms. long, and a large cystic ovary. Landau describes the uterus thus: 'It weighs over 2 kilos, is uniformly enlarged, and is divided by a sagittal suture. It is 19 cms. long, the uterus measuring 4 cms., the cavity being represented by a gaping slit. The uterus has grown in two distinct layers—an inner kernel zone, which attains a maximum thickness of 7 cms. anteriorly and 4.5 cms. posteriorly, and a shell of an average thickness of 1 cm., becoming a little thicker near the internal os. The latter consists of concentrically lamellated myometrium; the greater portion of the kernel mass consists of a coarse reticulated trellis-work of relatively broad muscular bundles, which is thrown into relief by the sinking in of the connective tissue lying in the meshes. The bundles are disposed for the most part in the circles or crescents round the tissues in the meshes. The latter appears darker and more spongy, and shows either notched and pit-like depressions, from a pin-point to a pin-head in size, or else circular or more irregular cysts, and elongated spaces up to the size of a pea, and all lined with a smooth inner wall like mucous membrane, and occasionally containing reddish-brown fluid masses. Even to the naked eye it is evident that the tissue in the meshes is directly continuous with the mucosa of the cavity of the body of the uterus, and represents an extension of the same into the uterine parenchyma, for the elongated and cyst-like spaces open free into this cavity. In corresponding fashion there is microscopically no difference between the corporeal mucosa and the interfascicular tissue of the central mass. In the spread-out covering of the central tumour mass, which invests the whole cavity like a tube or mantle, can be readily recognized the myometrium. This has become reduced to the slender shell above described; and it is easy to trace how, out of its parallel concentric lamellæ, crescentic muscular

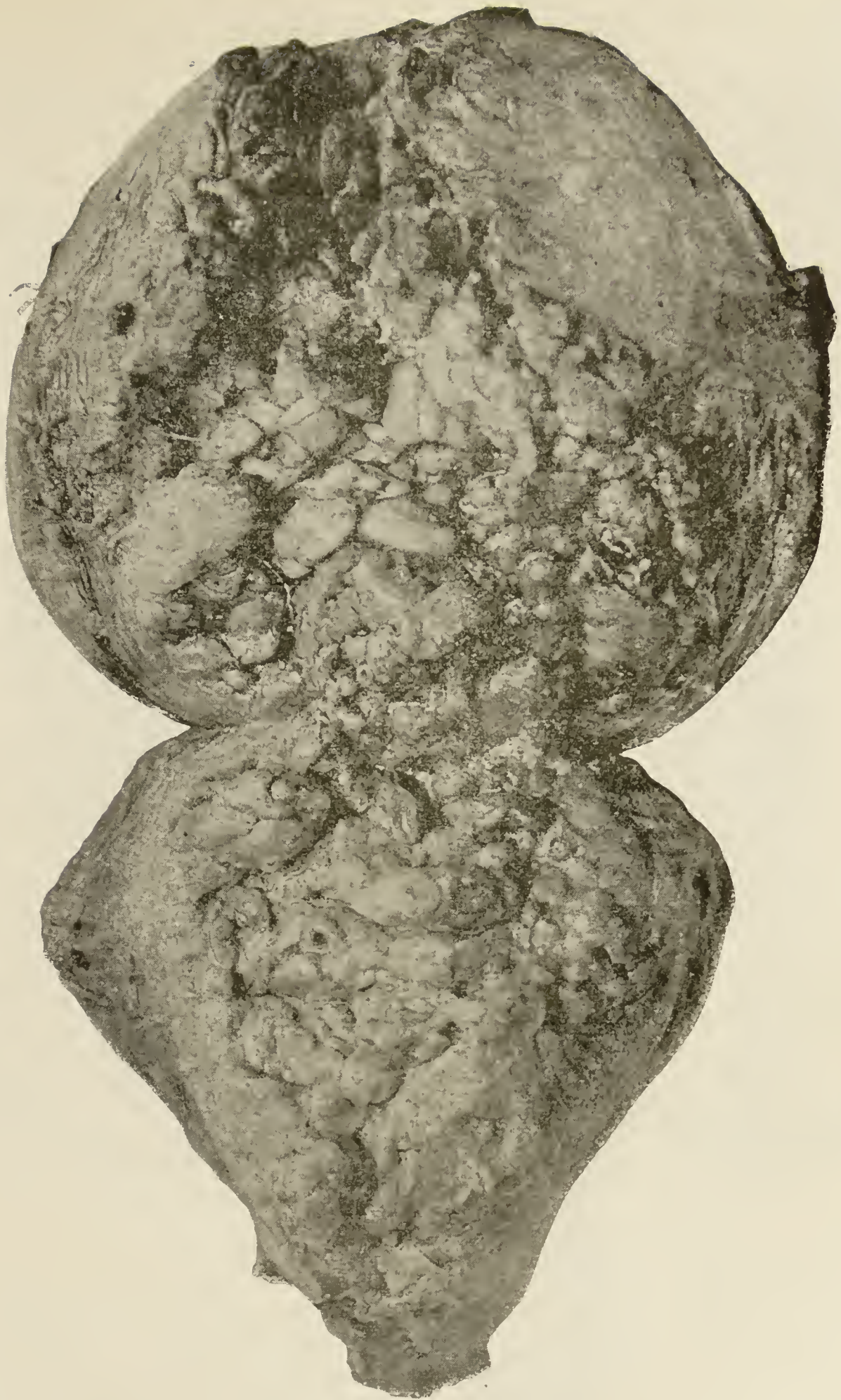


FIG. 283.—ADENOMA UNIVERSALE. (OLIVER.) Uterus of patient, aged 34; virgin.

Two mucous polypi were removed from an enlarged uterus, and a third two years later, when the uterus was dilated, explored, and curetted. Watery discharges followed, with increase in the size of the tumour. The patient was re-curetted, and subsequently the uterus was removed by abdominal pan-hysterectomy. Weight of uterus, twenty-eight ounces; size, that of a three months' pregnancy. The figure shows the uterus opened by a triangular flap, made from the cervix to the fundus, and the enormous number of smooth prominences, some sessile, a few pedunculated. The new growth had quite infiltrated the muscular tissue. The microscopical appearances were typical of carcinoma. Oliver gives to the pathological condition the name of 'adenoma universale,' rather than that of malignant adenoma. The history of the case would point to the disease having lasted for some years.*

* *Brit. Gyn. Jour.*, May, 1899.

bands have spread out in all directions, and extended in tortuous fashion into the muscular framework of the core of the tumour.

‘The patient was discharged cured in a month.’

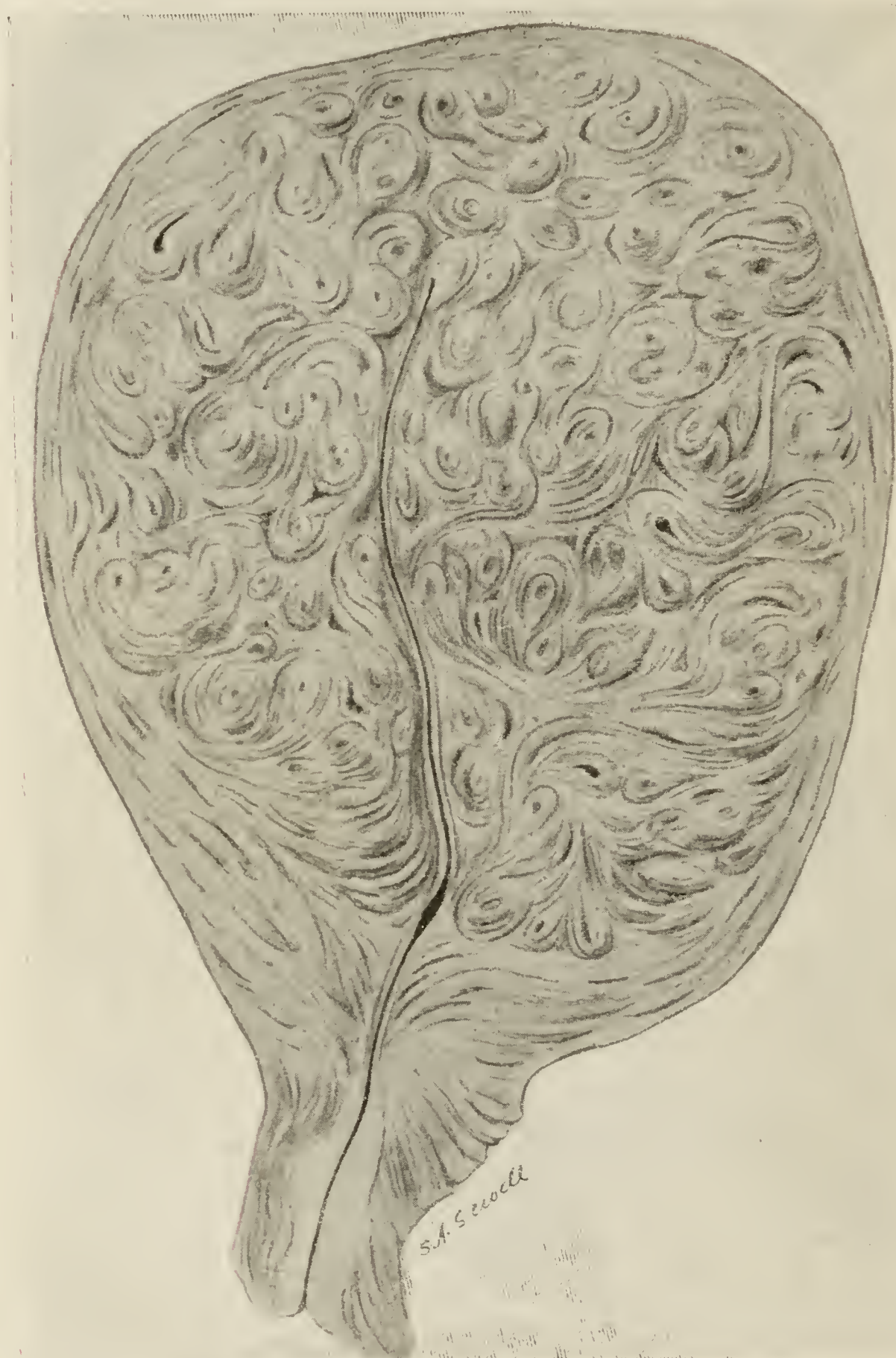
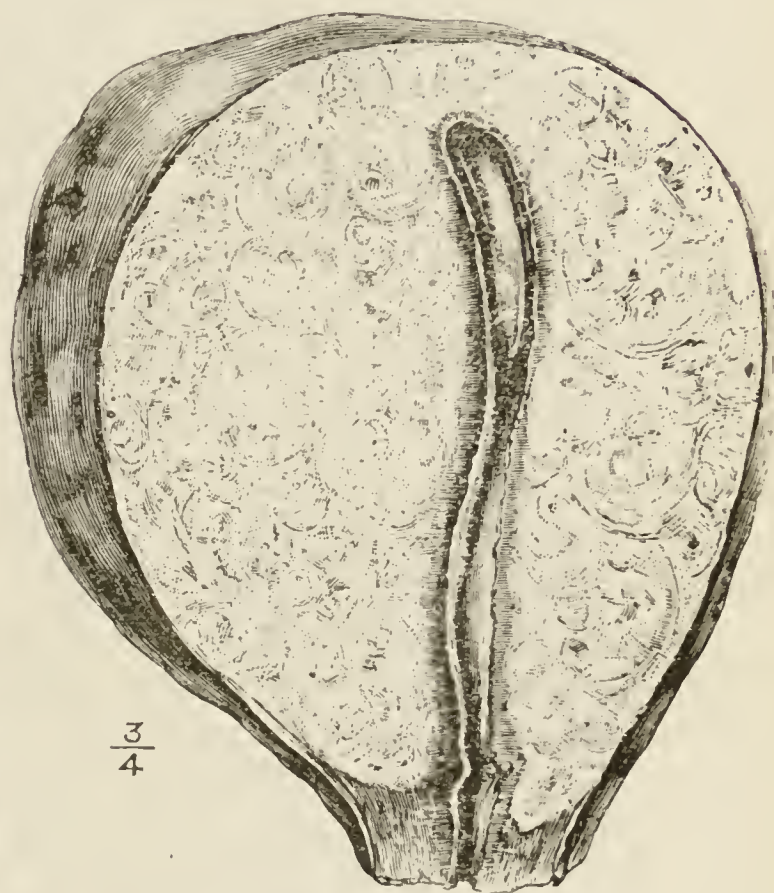
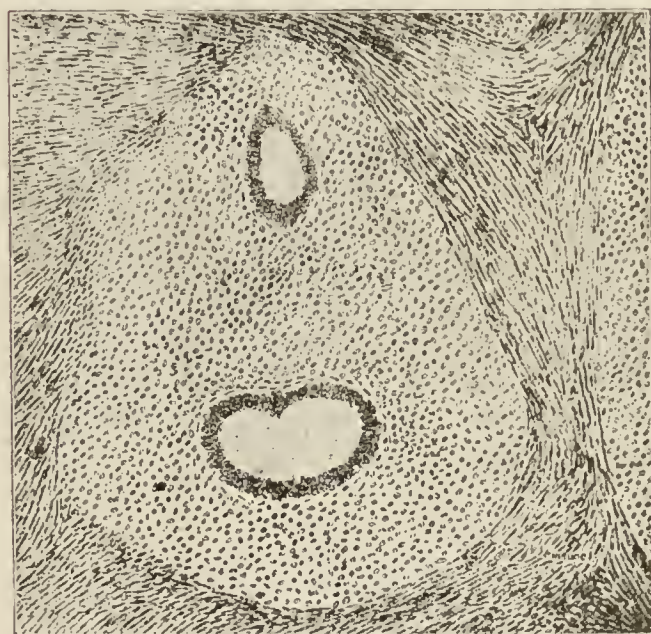


FIG. 284.—ADENOMA OF THE UTERUS DIAGNOSED AS MYOMA.
(LEOPOLD LANDAU.)

Murdoch Cameron and Frank Taylor operated on a case in which the macroscopical appearances were those of an ordinary fibro-myoma, the length of the uterus being 5 inches, breadth $3\frac{1}{4}$, and the antero-posterior diameter

2 $\frac{3}{4}$. Both appendages were affected, the tubes thickened and indurated, the ovaries cystic, the meso-salpinx thickened, and the pedicles containing an excess of fibrous tissue. The bulk of the tumour was composed of bundles of plain muscular tissue, interspersed amongst which were gland tubules embedded in a mass of richly cytogenic lymph adenoid connective tissue. The gland tubules were composed of a single layer of columnar epithelium lying on an intact basement membrane, and also some small cystic spaces lined by flattened epithelium, similar to the gland tubules of the endometrium. There were no cilia. The stroma exactly resembled the endometrium. Strands of gland tubules continuous with the interglandular stroma of the endometrium, containing lymph adenoid stroma, dipped down from the endometrium amongst and between the muscular bundles of the tumour, and the gland tubules were present up to within one-third of an inch from the serous covering of the uterus. The authors say with regard to the derivation of adeno-myomata from the Wölfian or the Müllerian ducts, that the former are sub-peritoneal and dorsal, and the latter intro-



FIGS. 285, 286.—UTERINE ADENOMA. (MURDOCH CAMERON AND F. E. TAYLOR.)

mural or sub-mucous, and frequently ventral. They refer to the 'rest cells' derived from the Wölfian ducts, which Von Recklinghausen believed to be the origin of the adeno-myomata. Their presence in the Fallopian tube, broad ligament, uterus, or vagina, is explained by the course of the Wölfian ducts. The relative proportions of glandular and muscular elements will determine the hardness or softness of the tumour, and if the gland tubules be dilated and contain fluid, a cyst-adenoma will be formed. Hence, Von Recklinghausen's classification into hard, soft, softest, or telangiectatic and cystic, the sub-peritoneal tumours being harder than the intramural, and the commonest site the tubal angle. They are devoid of a regular capsule, and hence there is no sharp differentiation from surrounding structures. The authors agree with Cullen that, quite independently of the Wölfian origin, the adenomata arise from the mucous membrane, and these

tumours have a central situation. The adenoma which arises from the uterine glands is a rare form. As regards the peritoneal origin of the growth, the authors ask if it be not possible for the peritoneum covering the uterus to be modified, and having dipped into its substance, to form adenomata by proliferation. Eschoff considered that the peritoneum covering a myomata might dip into it and be thus cut off, in a manner precisely similar to the canalicula of the mucous membrane.

Dangers to Life arising from Uterine Myomata.—The dangers to life arising from uterine myomata may be considered under these heads :—those which arise from extra-uterine complications, pelvic and other, and which are co-existent with the tumour ; degenerative in the tumour itself ; circulatory complications ; mental effects ; general consequences. To these we may add such accidental conditions as torsion of an ovarian pedicle, appendicitis, hernia (umbilical and other), and carcinoma of the cervix independent of the myoma.

The more serious, as they are the more common, of the first class are the complications due to diseased states of the adnexa. Here we have not only the consequences arising from the presence of the tumour itself, but the associated risks which are super-added by the ovarian or tubal disease which is attendant, and which has to be considered, not merely from its direct effects, but also from the influence it may exert on subsequent operative steps for removal of the myoma, through the formation of serous adhesions, the presence of pus in the pelvis, and the added difficulty of preventing bowel and septic complications. With regard to the bowel, in the days when the radical treatment of myoma was seldom thought of, and pressure on the bowel with the growing myoma in the pelvis frequently occurred, obstruction was no uncommon consequence as the growth of the myoma increased. And it is still one of those complications which compel interference. The frequent occurrence of omental and intestinal adhesions is known to every surgeon, and the unpleasant abdominal accompaniments of the myoma as it rises from the pelvis (such as pain and sickness, with flatulent distension), are the results. Both peritonitis and ascites are also frequent attendants on myoma. I recently operated on a patient, aged 50, who had a large myoma which for years had given no distress, when suddenly she had an attack of acute peritonitis, followed soon after by another, so severe that it forced on the operation. Such attacks of peritonitis bring about an accumulation of fluid in the peritoneum, and the resulting ascites likewise demands hysterectomy. They are to be expected after sudden

stretching of the peritoneum, subacute attacks of inflammation in the capsule of the tumour itself, rotations and subsequent torsion, associated adnexal disease, or secondary degenerations in the myoma. Of the urinary complications, the most serious are the secondary renal changes caused by pressure on the pelvic vessels and the ureter. In these the presence of albumen is an early evidence of the renal mischief. Various bladder troubles, such as frequency of or difficulty in the passing of urine, distension of the bladder, and the tendency to post-operative cystitis, are commonly met with. The imprudence of delaying operation until interference with the ureter results in hydronephrosis or pyo-nephrosis, is obvious. Mason Knox noted, among the complications of myoma out of twenty-two cases collected by him, these consequences : (1) ureteral pressure at the pelvic brim ; (2) ureter lifted up by the underlying tumours ; (3) ureter adherent over a considerable surface of the tumour ; (4) ureter surrounded by the tumour ; and, as more important, pyelonephrosis and pyoureter.

We now come to a complication which is probably that which most frequently compels operation—namely, hæmorrhage. Following in its wake are anæmia and cardiac affections. The profoundly anæmic state which we see as a result of the constant or recurring bleeding is associated with rhythmic irregularity, inefficient action or dilatation of the heart. The compensative hypertrophy, which is found in some cases of myoma, loses its value in face of the continued depletion and spanæmic state of the blood. How unfortunate it is to be compelled to subject a patient under these conditions to the effects of a prolonged operation, involving considerable, if not profound, shock, it is not necessary to say. The next class is one which has to be dealt with fully, as the occurrence of pregnancy with myoma is one of the most serious complications of the former. In a previous chapter I have entered fully into the disorders of mentalization which follow affections of the genitalia, foremost amongst which is tumour of the uterus.

Apart from all these diseased correlations of myoma, there are others which I have included under ‘general consequences.’ These are mainly deterioration in health generally, from pain, want of exercise, the sense of weight in the abdomen, constipation and urinary disturbance, and the depressing effect associated occasionally with insomnia. Cardiac rhythmic disturbance and hypertrophic valvular degenerations are frequently found in the instances of women who have suffered from a bleeding myoma, and, indeed, in

other cases in which hemorrhage is not a prominent sign. Add to these the possible presence of those accidental conditions referred to, and we must acknowledge, without any desire to exaggerate, or to accentuate the evils that may attend upon the presence of a myoma, that the complications which are found in its train are sufficiently grave to make the surgeon hesitate, or at least to consider carefully, before he decides to adopt tentative or palliative measures, even in a case in which no degenerative changes are suspected in the tumour itself.

Adhesions.

Perhaps not the least serious of the complications which have to be considered, in connection with the growth and the age of a myoma, are the adhesions, pelvic and extra-pelvic, which are liable to be formed between the tumour, the omentum, the intestine, the bladder, and the rectum. For not only have we to remember the direct effects of such adhesions on the viscera which are involved, but also the increase of the difficulties which have to be overcome at the time of operation, and the necessary prolongation of this in the management of the adhesions, or the complications and accidents they cause at the time, through the implication of the bowel, bladder, and ureters entailed by their separation, not to speak of hæmorrhage. Such occurrences as inversion of the uterus, and actual rotation of the tumour, are not to be forgotten, though they are very rare.

Adnexal Complications.

That the proportion of cases in which inflammatory, suppurative, cystic, and various degenerative changes, as well as neoplasms of either the ovaries or Fallopian tubes, or both, complicate myomatous tumours of the uterus, is considerable, cannot be gainsaid, and these may of themselves demand interference, independently of any question of expediency with regard to removal of the uterus. It may be a matter for discussion whether salpingo-oöphorectomy alone, without interference with the uterus, or combined with either supravaginal hysterectomy or hysterectomy, should be performed. If both adnexa be diseased to such an extent as to necessitate their removal, then it will be a question as between the supravaginal operation or that of pan-hysterectomy. Should those of only one side be so involved, and myomectomy can be performed, then there would be no justification for removal of the uterus.

Adnexal Tumours and Myoma—Oöphorectomy.—An interesting case bearing on this question came under observation a few years since. The patient, æt. 42, who had been seen by many gynæcologists, had suffered for some years from severe menorrhagia and metrorrhagia, with associated anæmia and consequent cardiac distress. She had had attacks of severe pelvic peritonitis, and there was more or less constant pain in the region of the ovaries. On examination, these latter were found enlarged and adherent. The uterus was about the size of the closed fist, and with a fibroid projection in the anterior wall. This explained the bladder irritation from which she suffered. I advised salpingo-oöphorectomy. I had not raised the question of hysterectomy. The operation was difficult and tedious, from the mass of adhesions in which the adnexa at both sides were embedded. These had literally to be “dug out” of the bed in which they lay concealed. On bringing the uterus forwards, the fundus was found to be studded all over with fibromatous projections, giving it a nodulated appearance, the principal nucleus being in the anterior wall. The operation was performed in 1896. Since then there have been no pelvic symptoms whatever, and when I last examined the uterus it was considerably reduced in size.

(1) Adhesions between the Tumour and the Genito-urinary Organs—(2) Infections of the Urinary Tract.—Though the symptoms



FIG. 287.—PYELONEPHROSIS AND PYOURETER.

The result of compression by a myomatous tumour at the pelvic brim (6 lbs.). The case was complicated by an appendical adhesion to the wall of the right ureter, above the constriction. Tumour removed by Howard Kelly, and one month later the kidney and portion of ureter by McCoy.*

of ureteral pressure are often negative, albumen and casts were noted several times, also pus and persistent pyurea, difficulty of micturition

* Mason Knox, *Amer. Jour. Obstet.*, vol. xlii., 1900.

and retention of urine, while death from uræmia occurred in three cases, and post-operative anuria in two, from nerve shock to the kidney after relief from the ureteral pressure. Retention of urine, severe pain in the side, in the renal region, or, in more extreme cases, the detection of a fluctuating tumour of varying extent in the lumbar region, are important signs and symptoms in diagnosis. The catheterization of the ureters by means of the cystoscope will determine the site of the constriction; a wax tip on the end of the catheter, the presence of a calculus; and the examination of the urine which is drawn off, the condition of the kidney.

CHAPTER XXII.

UTERINE NEOPLASMS—MYOMA (continued).

Differential Diagnosis and Palliative Treatment.

Diagnosis.

We distinguish a fibroid tumour of the body of the uterus by—

The history of the case.

Careful examination of the abdomen (see ‘Examination of a Case’ and ‘Methods of Examination’).

Digital and bimanual examination (rectal and vaginal).

The uterine sound.

The diagnosis of some fibroid tumours of the uterus is not always so easy a matter as it may appear. When a student, I saw an excellent surgeon, after the preliminary incision for ovariectomy, vainly endeavouring to push a trocar into a solid fibroid of the uterus. Several experienced physicians and surgeons had concurred in the diagnosis. By that lesson (the woman died the same day) I was early taught the need for that extreme caution which we must exercise in ambiguous cases before we arrive at a conclusion, or pronounce an opinion. The old dictum, ‘Verify, verify, and for a third time verify,’ is not more truly applicable to anything than to the case of abdominal tumours. While exercising all the care and caution that he possibly can, the surgeon may fall into error in some cases. Spencer Wells said: ‘In fact, it has happened to many surgeons, and to myself amongst the number, that we have commenced operations, as ovariectomy, and even removed tumours from the abdomen, under the impression that we were dealing with diseased ovaries, when, upon examination, they have proved to be pedunculated fibroid outgrowths from the uterus.’

At a meeting of the Gynæcological Society (June 23, 1886), Lawson Tait exhibited ‘a huge suppurating cyst, consisting of the dilated structure of the left kidney. The patient had been seen previously by Sir Spencer Wells, who had diagnosed fibroid tumour of the uterus, and by a distinguished London physician, who remarked that he did not think there was anything very much the matter. Dr. Milner Moore of Coventry was called in, and diagnosed a suppurating ovarian tumour. Tait saw the patient and confirmed this view, believing that the suppuration was due to strangulation and axial

rotation. All the opinions proved to be wrong, for the tumour turned out at operation to be the left kidney.' The patient made an admirable recovery!

History of the Case.—Three negative points are of importance : that the tumour has not appeared suddenly ; that there have been



FIG. 288. — A PEDUNCULATED SUBPERITONEAL FIBROID, WITH MULTIPLE NUCLEI SPRINGING FROM THE FUNDUS UTERI. (AUTHOR.)

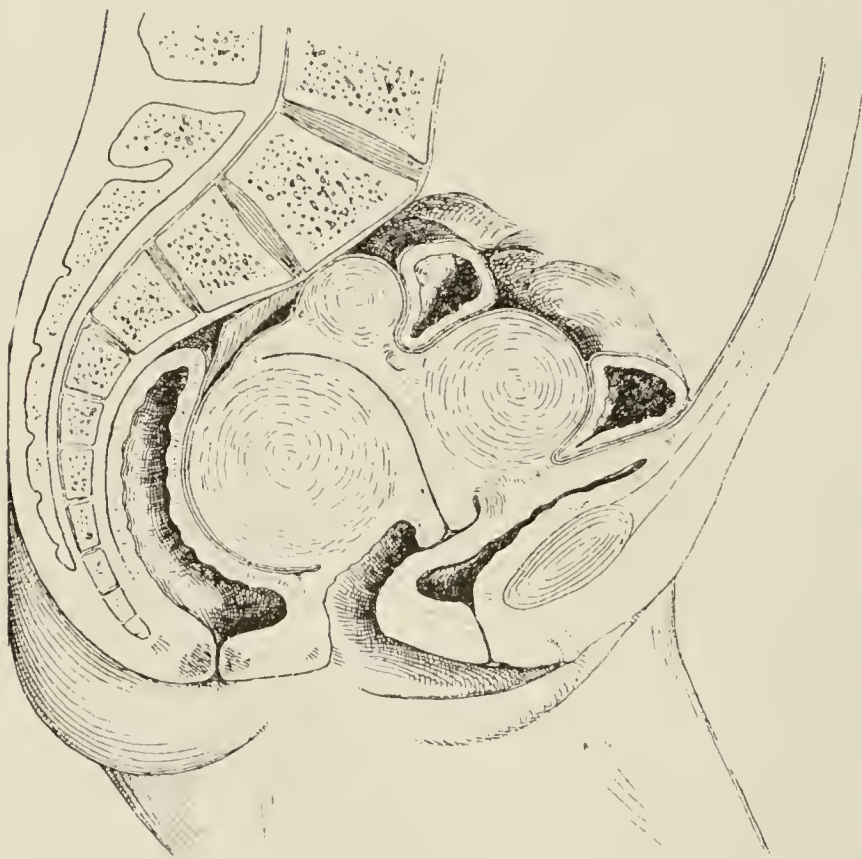
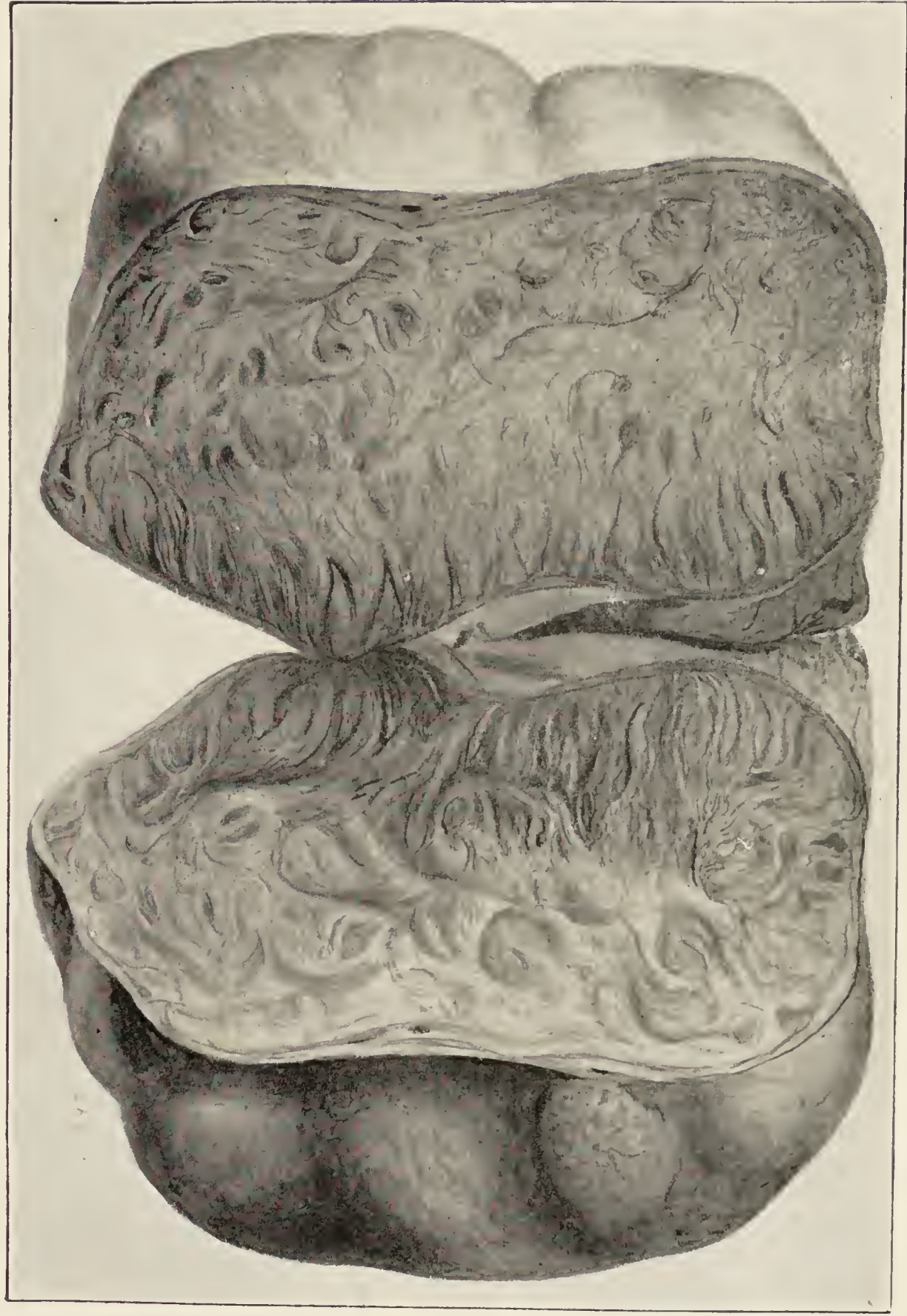


FIG. 289. — RETROVERSION OF A FIBROMATOUS UTERUS. (DOYEN.)

no symptoms in the early history of the case of a febrile state ; rarely is there any history of an injury. There has commonly been hæmorrhage, both menorrhagia and metrorrhagia. This latter symptom varies in degree. Occasionally the menstrual periods are irregular, and the discharge scanty. There may have been pelvic distress, and some trouble of the bladder and rectum. These pelvic symptoms depend on the position of the tumour, its size, and the rapidity of its growth. This is generally slower than in ovarian cystoma. There is not the same rapid emaciation of the countenance which we see so commonly in ovarian disease. Many women who have large uterine fibroids do not exhibit any marked change in the expression of the face, nor is the fibroid affection accompanied by the same pallor of

the countenance, unless there be hæmorrhage, that marks the

PLATE XXXVII.

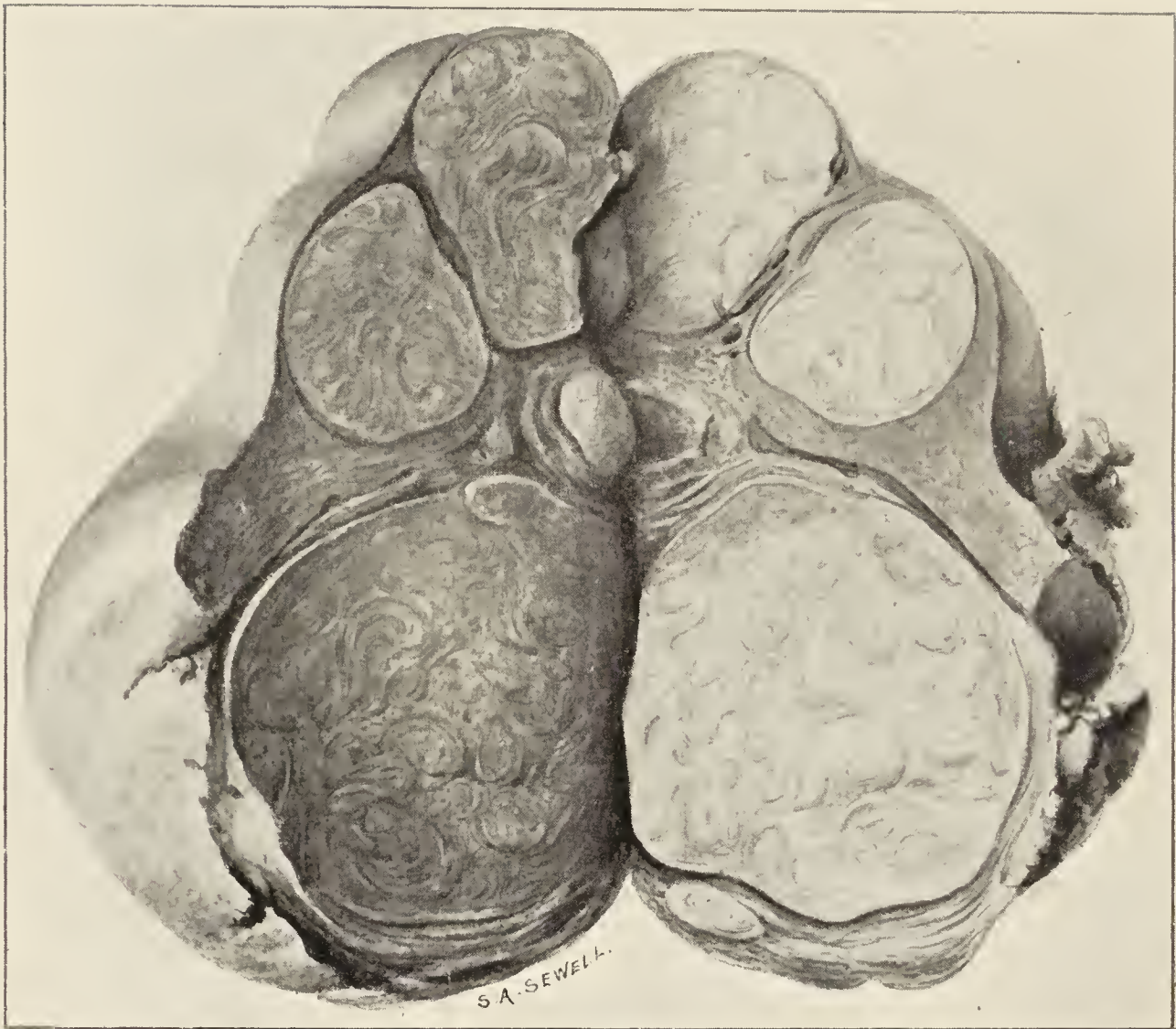


LARGE INTRAMURAL MYOMA OF THE UTERUS, SHOWING ITS RETICULATED STRUCTURE REMOVED BY

SUPRA-VAGINAL HYSTERECTOMY. (AUTHOR.)

[To face p. 426.]

PLATE XXXVIII.



UTERINE MYOMA WITH EMBEDDED MULTIPLE NUCLEI REMOVED AT THE CLIMACTERIC BY SUPRA-VAGINAL HYSTERECTOMY. (AUTHOR.)

[To face p. 427.]

growth of the ovarian cyst. The presence or absence of pain will in great measure depend on the position of the tumour, whether it be pediculated, and the direction in which it grows. Periodical attacks of peritonitis, interference with the functions of the bladder



FIG. 290. — FIBROMYOMA, SPRINGING FROM THE LIGAMENT OF THE OVARY. (DOLÉRIIS.)

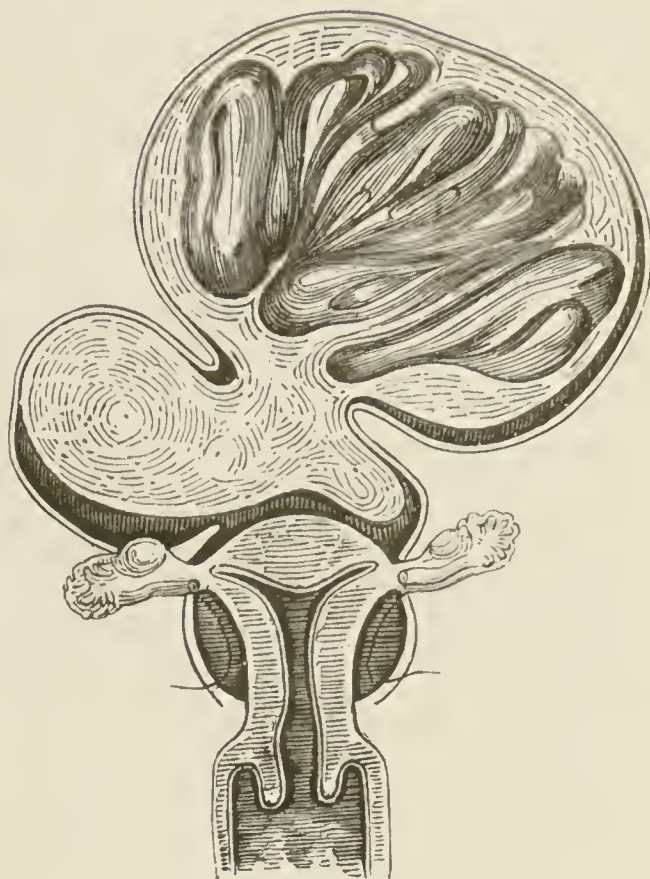


FIG. 291. — PEDICULATED FIBROMA OF UTERUS, WITH FIBRO-CYSTIC INTERIOR IN ONE DIVISION. (SCHRÖDER.)

or rectum, and inflammatory changes in the tumour itself, will give rise to pain. Recurrent attacks of acute pain are indications of some axial rotation and twisting of the pedicle. We often, however, see large uterine fibroids, the growth of which has not been attended by pain.

Differential Signs (Positive) of Fibromyomatous Tumour.

Enlargement of the lower portion of abdomen.

Enlargement of the superficial abdominal veins.

On palpation we find a solid, symmetrical, and fixed tumour, though this will depend on the nature, shape, attachment, and the direction of growth as well as the adnexal complications of the tumour.

Tumour usually central; the increase in abdominal measurement is most marked from the pubes to the umbilicus.

The uterine enlargement, even early in the disease, may be defined by palpation and percussion over the pubes. Vascular murmurs are frequently heard synchronous with the pulse.

By such an examination, the uterus is found enlarged, either in its anterior or posterior wall. The extreme hardness may be at once apparent to the finger, or we may find two or three nodular enlargements; or the entire uterus may feel like a hard, immovable mass, fixed in the pelvis.

Adherent Adnexal Masses.—The condition which, in a superficial examination, is most liable to be mistaken for a myomatous mass, is an old and hard infiltration in the pelvis, in which the ovaries and tubes are involved, they themselves being possibly firmly embedded in the exudation, adherent to the uterus, and probably also to the bowel and surrounding pelvic structures. It is almost impossible, save under a most careful bimanual examination under an anæsthetic (and even here it is difficult), to differentiate between a myoma and a parametric exudation with pus tubes and adherent ovaries. Two cases recently seen by me will exemplify this difficulty. In one, a patient had had a pessary applied for a retroflexed uterus. After a time another gynæcologist diagnosed a myoma. A third, seeing her shortly afterwards, considered the case to be one of inoperable carcinoma. I saw her, and at the first examination (without anæsthesia) concurred in the view that it was a myoma. Advising operation, I learned afterwards that the case was one of old pyosalpinx, with a hard infiltration incorporating it with an enlarged uterus.

In the other instance, there was a difference of opinion as to myoma or adnexal tumour. At operation a hard infiltration extended across the entire pelvis, involving both tubes and ovaries; and another dense mass, firmly attached to the uterus, over its posterior wall, contained a portion of the rectum, which tunnelled its centre. Where the adnexal masses are attached bi-laterally to the cornua of the uterus, and thus appear continuous with its walls, they closely resemble myomata.

The os uteri is generally healthy, at times depressed; but more frequently, in advanced fibroid tumour, it has receded, and may not be reached by the examining finger.

There is occasionally a characteristic hardness of the cervix, which may be felt, like the nipple of the breast, moving over the growth underneath. This mobility of the conical cervix, independent of the enlarged body, is very marked in many cases of fibroid tumour.

The rectal and recto-vaginal examinations discover the enlarged, fixed, and hardened uterus.

The only method, however, of preventing an error is by making a careful bimanual examination in the dorsal position. In certain

cases even this is unreliable, unless we resort to anæsthesia and verify by the sound.

Negative Signs.

There is not (generally) any fulness or prominence of the umbilicus.

There is not (save in fibro-cystic disease), unless there be ascitic fluid present, any fluctuation. Should there be, it is very different from the superficial wave seen in ovarian disease.

(When there is a hard pelvic tumour, and at the same time evidence of the presence of fluid, we suspect the fluid to be ascitic.)

There are no uterine contractions.

The characteristic signs of pregnancy are absent.

Jones * has drawn attention to a condition of the pregnant uterus which may be mistaken for a fibroid tumour, in which the characteristic feel of the former is absent, as also the pear-shape of pregnancy, there being a false sensation of the presence of a pedicle. He attributed it to an absence of the amniotic fluid. Pozzi ascribes it rather to a pre-existing condition of hypertrophy or elongation of the neck of the uterus.

The Uterine Sound.—We thus see that in a considerable proportion of cases we may feel satisfied of the nature of the tumour without the use of the uterine sound. But this mode of examination is absolutely necessary to confirm the diagnosis in some cases. By it we learn (utero-abdominal, utero-vaginal, and utero-rectal methods)—

- (a) The degree to which the uterus is enlarged ;
- (b) That the tumour felt through the abdominal wall is an enlarged uterus ;
- (c) That the tumour is fixed or movable ;
- (d) To differentiate fibroid tumours from other pelvic enlargements or flexions of the uterus.

Dilatation by Tents and Exploration.—In some cases, when still in doubt, we may have to dilate the uterus and explore the cavity with the finger.

In a case of supposed blighted ovum, Schröder dilated the uterine canal, and the tumour was discovered to be a hard fibroid. The same step may be needed in chronic hyperplasia. In the diagnosis of fibroid of the fundus or submucous pediculated tumours, dilatation and exploration with the finger are necessary, in order to discover such growths.

* *Edinburgh Medical Journal*, March, 1888.

Symptoms.—Uterine fibroids frequently exist, and yet there are no symptoms to attract attention during life. Their presence is only discovered in a post-mortem examination. The most important symptom, as it is generally the earliest, is menorrhagia. This comes on gradually, at first as an increase of the menstrual period, amounting, after a time, to flooding, or there may be

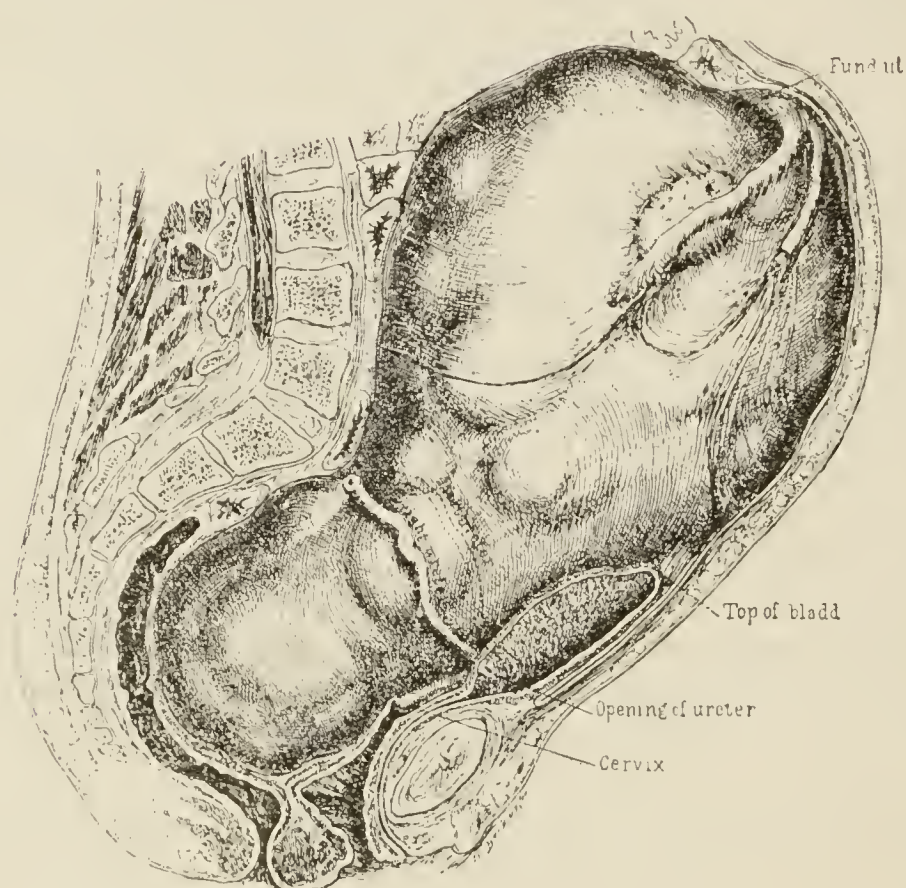


FIG. 292.—LARGE UTERINE FIBROID WITH EXTENSIVE SUBPERITONEAL RELATIONS FILLING THE PELVIS AND ABDOMINAL CAVITY; ADNEXA ON THE SUMMIT OF THE TUMOUR. (HOWARD KELLY.)

irregular hæmorrhages. The loss of blood may threaten the life of the patient. Death has followed from a rupture of a uterine sinus. Large vessels do not generally enter a uterine fibroid, or only such as have no capsule. The blood is poured out by the congested mucous membrane of the uterus. Cervical fibroids do not, as a rule, cause hæmorrhage.

Pain.—This assumes, in some instances, the form of dysmenorrhœa, especially in the case of the cervical fibroid. Pain also occurs from the weight and distension, and the pressure of the tumour on the viscera and nerves of the pelvis. It is frequently of a 'bearing-down' nature. It accompanies slight attacks of peritonitis as the tumour grows or shifts its position. It is present when there is any axial rotation of the pedicle.

Pelvic Symptoms.—Pressure on the bladder, rectum, and ureters produces frequent and painful micturition, constipation, and pain

in defæcation. It may lead to hydro-nephrosis, or albuminuria, with uræmic symptoms. The consequences that may arise from compression of the ureters have to be kept in mind in cases of growing or large fibromata, and will naturally suggest that the urine in these cases should be from time to time examined, not alone for the presence of albumen or hyaline casts, but also for an increase in the quantity of urea.

Sterility.—This is a common consequence of uterine fibroid symptoms arising from the presence of pregnancy. Fibroid tumours may induce abortion, seriously complicate labour, and cause post-partum hæmorrhage.

Some Terminations of Fibromyoma.

1. **Arrest of Development.**—It may thus interfere but little with the health or comfort of the individual.

2. **Spontaneous Absorption.**—This is extremely rare.

3. **Spontaneous Eucleation.**—The tumour is protruded through the lacerated or sloughing mucous membrane. It is thus uncovered, and is forced onwards into the vagina by the uterine contraction.

4. The tumour becomes pediculated, and is extruded into the vagina in the form of a polypus; or, if subperitoneal, becomes adherent, and remains either attached to some organ or lies loose in the peritoneal cavity.

5. **Suppuration and Gangrene.**—This may lead to perforation of the other viscera, peritonitis, and septicæmia. The fibromyoma may thus be disintegrated and discharged in fragments.

6. **Degenerations.**—The various forms of degeneration already enumerated.

7. **Adhesions.**—Adhesions form between the tumour and any of the neighbouring viscera, more particularly the omentum, intestine, bladder, and rectum. Such adhesions cause hepatic, renal, and pelvic complications.

8. **Inversion of the Uterus.**—It is well to recollect that those fibroid tumours having a broad base, and which are connected with the parenchyma of the fundus, may cause, in their growth and extrusion, partial inversion of the uterus.

Fibro-Cystic Tumours.*

Differentiation.—I hardly know any affection in the diagnosis of which the practitioner is more likely to fall into error, than in that of a large fibro-cyst of the uterus. I can recall to mind a few cases myself, in which, notwithstanding repeated and most exhaustive examinations, I have been mistaken. Still, this liability to err is, with our improved knowledge, becoming less each day. If the practitioner be resolved to take nothing for granted in the examination of a patient, and pass step by step by a process of exclusion to his final judgment, he will not be likely to make any mistake. Let us suppose that he has to distinguish in a given case *between ovarian tumour, pregnancy, and a fibro-cyst* of the uterus. He must, in deciding the question of fibro-cyst, side by side with the other two conditions, fibro-cyst or ovarian tumour, be influenced by these clinical facts.

1. The length of time the tumour has taken to grow, and its mode of growth.
2. In palpation, the irregularity or dense feel of the tumour in parts.
3. The obscure character of the fluctuation as compared with ovarian dropsy.
4. *The exclusion of the signs and symptoms of pregnancy.*
5. The depth to which the uterine sound passes.
6. The mobility of the tumour with the uterus, both with the uterine sound and bimanually.
7. A careful examination by the rectum and vagina of the tumour *under an anæsthetic*, in the bimanual method.
8. Aspiration and examination of the fluid.
 - (a) Its property of coagulating, spontaneously and by heat.
 - (b) The presence of Atlee's fibre-cell.
9. By an exploratory incision: the colour of the uterine wall (dark red) is characteristic and quite distinct from the appearance of the cyst wall of the ovarian cystoma.¹

(See chapter on Diagnosis of Ovarian Tumours.)

Palliative Treatment of Uterine Tumours.—*The Palliative and Expectant Method consists in the use of means calculated—*

1. To reduce hyperæmia and congestion.
2. To control and prevent hæmorrhage.
3. To promote absorption of the tumour.
4. To subdue pain and relieve rectal and vesical distress, and reduce hyperæmia and congestion.

To reduce Hyperæmia and Congestion. Internally, for this object we give such medicines as ergot (liquid extract); hydrastis; stypticine; digitalis; iodide of potassium; bromides of sodium and potassium; chloride of calcium; a course of Woodhall Spa, Kreuznach, or Salsomaggiore waters.

* See p. 411 for Etiology.

Bedford Brown reports favourably of the prolonged use of Syrup of Lactophosphate of Lime and the Syrup of the Hypophosphites, given in zii . doses three times in the day. In anæmia from recurrent hæmorrhage in fibroids, this combination is an admirable restorative and tonic.

Hydrastis Canadensis.—My success with hydrastis in fibroids has been uncertain. I have given it in a number of cases, both as tincture, fluid, and extract; also hydrastia and hydrastinine. A useful mixture for checking hæmorrhage is—

R. Acid sclerotic, gr. iv.
Tinct. digitalis, min. lxxx.
Tinct. hydrastis Can. zss .
Tinct. matico, zss .
Elix. saccharin, min. xxx.
Inf. matico ad zvi iii.

One-eighth part every third or fourth hour.

The liquid extract of ergot (zss .) or ergole may be substituted for the sclerotic acid, and tincture of strophanthus for the tincture of digitalis, or the strophanthus may be given in combination with the latter.

I have previously (p. 207) entered fully into the therapeutical uses of hydrastis, its alkaloid hydrastia, and stypticine. Both the palatinoids of sclerotic acid and stypticine, with those of strophanthus, are of use in cases of bleeding fibroid.

Locally, we may apply the hot vaginal douche; scarify the cervix; use astringent tampons of tannic acid and glycerine, adrenalin, and ichthyol.

Sexual intercourse must be moderated, and especially it should be avoided about the menstrual periods.

To control Hæmorrhage.—The subcutaneous injection of ergotine, as recommended by Hildebrandt, is occasionally efficacious in controlling hæmorrhage. I have injected as much as 15 grains of Bonjean's ergotine, mixed with water and glycerine, into the gluteal region; but the average dose is 3 to 5 grains. The sterilized needle must be passed deeply into the muscle, otherwise we are apt to cause an abscess. Much cannot be hoped for any result further than the control of the hæmorrhage. The action on the structure of the tumour, or in promoting spontaneous expulsion of intra-uterine fibromata, has been unsatisfactory even after some hundreds of injections. Sclerotic acid and stypticine may also be used subcutaneously. The solution of ergotine should be made fresh. Astringents may be given internally. The douche of hot water, 115° to 120° , should be used for ten to fifteen minutes three times in the day.

Dilatation of the Cervical Canal with sponge or laminaria tents will

be found a valuable means of temporarily treating hæmorrhage, or, in the case of a cervical fibroid, and where there is dysmenorrhœa, incision of the cervix.

To promote Absorption of the Tumour.—Ergot, ergole, or ergotine, in the manner recommended, especially if the tumour be submucous or interstitial, and not very hard, may be tried ; also perchloride of mercury, iodide of potassium, iodine baths, or the spas of Woodhall, Kreuznach, or Salsomaggiore.

Electrolysis was first advised by Cutter. He passed the current through the tumour by two strong steel electrodes, inserted at either side of the abdomen, and reported an arrest in the growth in thirty-two out of fifty cases treated in this manner. The practice is seldom resorted to.

Electro-Caustic Treatment.—The name of Apostoli, of Paris, has now become prominently associated with the *electro-caustic* treatment of uterine fibromata.*

To relieve Pain and Rectal or Vesical Distress.—This must be subdued by bromides and sedatives. The tumour, if large and pressing on the pelvic viscera, should be pushed up out of the true pelvis. If it be subperitoneal, great relief may follow this step. Special attention must be paid to the bladder and rectum. Any accumulation in the latter should be prevented. The occasional use of an enema will be indicated. If a small myoma in the anterior wall of the uterus resting on the neck of the bladder should cause vesical distress, much relief may be afforded by the adjustment of a comfortably fitting Galabin's pessary. This raises the uterus off the bladder, and relieves the pressure.†

* See Electro-therapeutics.

† See chapter on Displacements.

CHAPTER XXIII.

UTERINE NEOPLASMS—MYOMA (continued).

Pregnancy complicating Myoma—Differentiation—Diagnosis and Treatment.

Differentiation and Diagnosis.

THE possibility of pregnancy and fibroma of the uterus coexisting must not be forgotten, especially in those cases in which we are assured of a rapid growth of the tumour. We must not be misled by the fact that the catamenia have appeared. We may be confronted with a case in which the existence of pregnancy is not suspected, the presence of a tumour alone being recognized; or one in which the woman has been ignorant of the presence of a tumour, and attributes her symptoms to pregnancy. Or, again, we may be called to a case in which, though cognisant of the presence of a tumour, she fancies (through the cessation of the menstrual act) that she has become pregnant. In any suspicious case careful regard must be paid to all the signs and symptoms, positive and negative, of the existence of pregnancy. She should be examined under anæsthesia, and, if a diagnosis cannot be arrived at, periodical examination should be made to estimate the growth of the tumour, determine the presence or absence of the signs of pregnancy, and the condition of the patient.

Errors in Diagnosis.—It has to be remembered that serious errors of diagnosis have been made with regard to fibroma and pregnancy. *The uterine pains* due to the tumour, when there has been effacement of the cervix, have been mistaken for those of labour, as pointed out by Puech,* and a rapid maternal pulse for the foetal pulsations.

* *Archives de Gynæcol.*, vol. xxii., Nov. 11, 1895; *Gaz. des Hôpitaux*, Aug., 1895; and *Brit. Gyn. Journ.*, pp. 44-46, 1896 (Haultain—Cases of Myoma complicating Pregnancy—*ibid.*).

The prominences occasioned by the foetal members disappear when the uterus contracts, while those of fibromata are made more manifest. The



FIG. 293.—SPECIMEN OF MYOMATOUS PREGNANT UTERUS AND FÆTUS SUCCESSFULLY REMOVED BY VAGINAL PAN-HYSTERECTOMY. (G. ELDER.) (Page 438.)

same author quotes instances in which fibroma has been mistaken for ovarian cystoma at the time of labour, and *vice versâ*. Many most distinguished

gynæcologists have fallen into this error. *Irregular hæmorrhagic discharges* may persist during pregnancy in cases of fibrous tumour. It may be necessary, in order to clear the diagnosis, to use a fine aspirating-needle in the interval between the pains. Fibroma of the cervix has been mistaken for *malignant disease*. Here attention to the distinctive features of carcinoma should prevent error. *Tumours growing from the pelvic walls*, such as fibromata, osteomata, and enchondromata, may be mistaken for uterine fibromata. Careful exploration to determine the independence of the uterus, under an anæsthetic, will prevent this. *Fæcal tumours* have also (Braxton Hicks) been confounded with fibroma. As to *placenta prævia*, careful exploration will lead to a recognition of the characteristic feel of the placenta, though of course a fibroma may complicate the presentation, and this must be remembered in the examination. This fact is important, that hæmorrhage

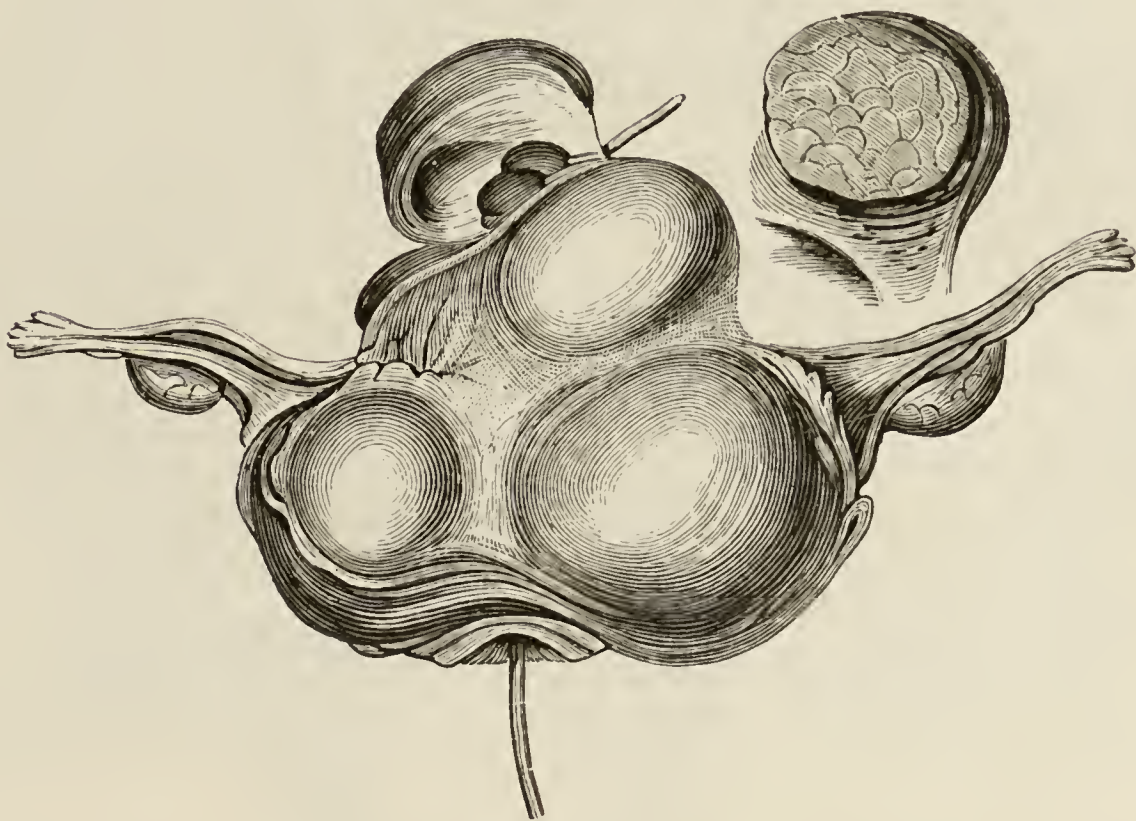


FIG. 294.—INTERSTITIAL FIBROMATA OCCURRING IN A UTERUS IN WHICH TRIPLE CONCEPTION OCCURRED, DELIVERY BEING EFFECTED AT THE NINTH MONTH.

Three large myomata occupy the entire uterus; a fourth grows from the fundus, to which three smaller ones are attached—one of these is becoming pediculated and subperitoneal. There was no rupture (see p. 430).

is more likely to occur during the latter months of pregnancy from the placental complication, while it may take place at any time during the nine months, and may last all through, with irregular pains, in the case of the uterine tumour.

The existence of a fibroma-myoma may only be accidentally discovered when an examination is made to decide the question of pregnancy, when the hardness of the mass and the irregularity of the surface of the abdomen will arouse suspicion.

Fibromitis mistaken for Pregnancy.—Under the name *fibromitis* Mérière has drawn attention to an interstitial inflammation of fibroids, caused either by injury, exposure to cold, or occupation. There are the premonitory

symptoms of inflammation—local pain and tenderness, general malaise, and constitutional disturbance. These are attended by rapid enlargement of the tumour. Symptoms of pelvic peritonitis may supervene. If suppuration should occur, the usual symptoms attend on it. Such an abscess may involve the adjacent viscera. The course of this disease is tedious, though the prognosis is generally favourable. The affection must not be confounded with hæmatocele, pelvic peritonitis, or renal or hepatic colic.

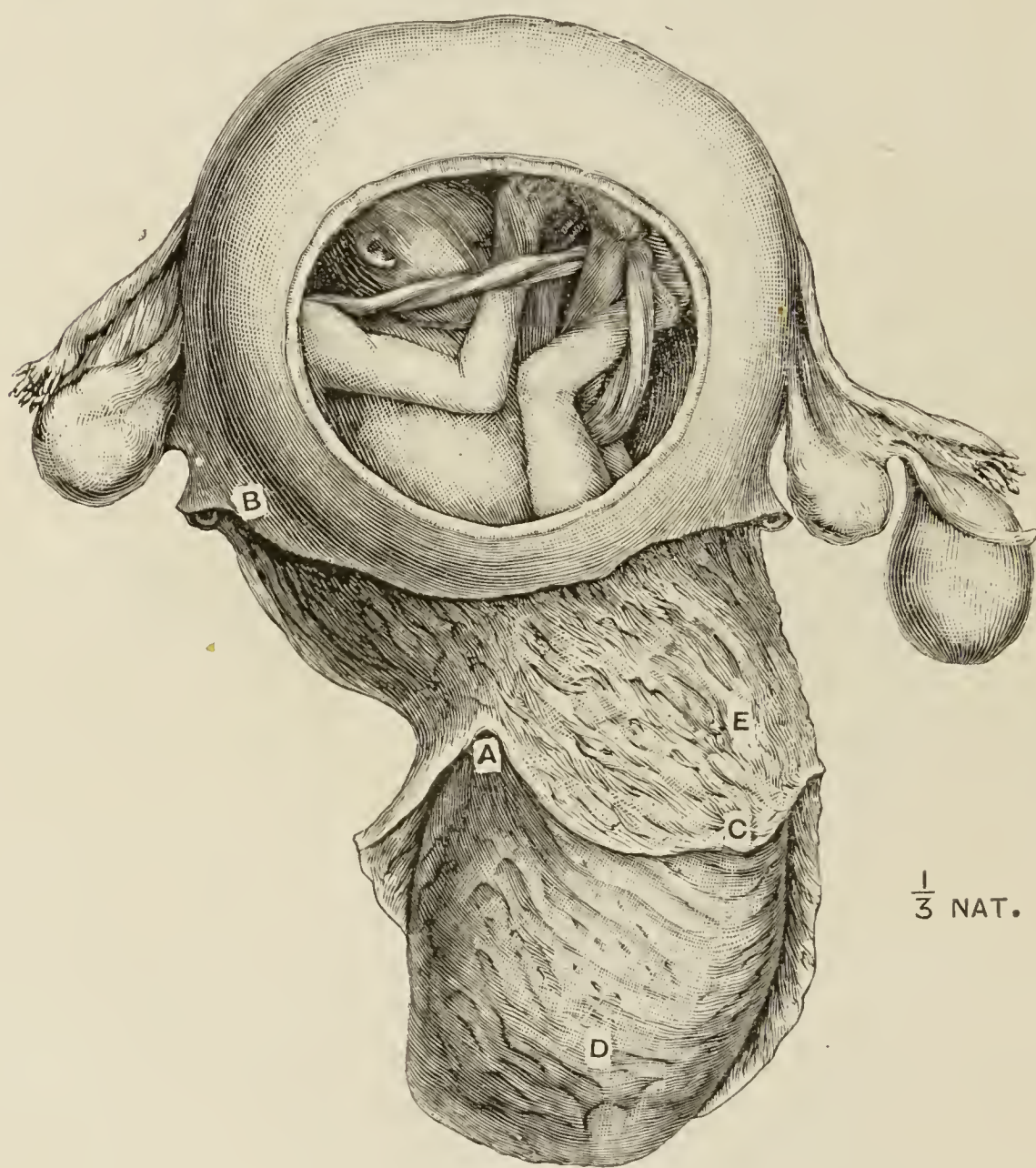


FIG. 295.

A, os uteri externum. B, cut edge of peritoneum on anterior uterine wall. C, cut edge of vaginal reflection pushed down. D, vaginal portion of tumour. E, supra-vaginal portion of tumour. (W. DUNCAN.)

A patient supposed to be in the third month of pregnancy had passed two menstrual periods. She suffered from abdominal tenderness, pain, and sickness. All the symptoms of fibromitis just detailed were present. Examination disclosed a large and irregularly growing fibroma. Time proved that it was uncomplicated with pregnancy.

In Elder's case,* on the left broad ligament there was a series of small pedunculated myomata, in all about the size of a foetal head at term. In the uterine wall was another flattened myomatous mass, and other nodules existed

* Page 436.

both in the fundus and cervix. The growth, which had caused intestinal obstruction, was successfully removed by supra-vaginal extra-peritoneal hysterectomy, an important feature of the case being that the patient had never suspected any uterine trouble until she became pregnant.

The drawing, Fig. 294, is one of an interesting case, the particulars of which are recorded by McClintock ('Diseases of Women').

It represents a uterus affected with interstitial fibromata, which was taken shortly after death from a woman in the Rotunda Hospital, Dublin, and which is in its museum. There was a triple conception, gestation being prolonged to the ninth month. The mother was delivered at her home of a dead female



FIG. 296.—PREGNANT UTERUS WITH MYOMA—HYSTERECTOMY. RECOVERY.
(MUSEUM OF SÄNGER'S KLINIK, PRAGUE.)

Patient, aged 37, a multipara, the last labour having taken place three and a half years previously. Irregularity of the catamenia, followed by severe hæmorrhage, were the principal symptoms. The uterus was removed by supravaginal amputation, the tumour being about the size of the foetal head. child. She was brought to the Rotunda, where a second child was born alive, the third child being extracted. She died in three hours, of collapse.

William Duncan (London) records an interesting case* (Fig. 295). The patient, aged 38, had had several previous miscarriages—the last, eighteen months prior to the operation; subsequently to which the growth had become perceptible, growing into a smooth, firm, elastic tumour, reaching to the umbilicus. Examination under anæsthesia determined the presence of pregnancy, revealing also a soft, round, red tumour filling the upper half of the vagina, and apparently springing from the posterior and left side of the cervix, and at these parts so closely adherent to the vaginal wall

* *Lancet*, March 3, 1900.

that it seemed to be growing into it. Pan-hysterectomy was performed successfully.



FIG. 297.—INTERSTITIAL PREGNANCY IN MYOMATOUS UTERUS—HYSTERECTOMY.
(MUSEUM OF SÄNGER'S KLINIK, PRAGUE.)

This specimen was taken from a patient aged 29, who had had two previous labours, the last occurring five years previously. For six weeks after the last period there was a continuous drain, and pain in the hypogastria and lumbar region. A diagnosis of tubal pregnancy with myoma having been made, pan-hysterectomy was performed, and the uterus with the adnexa and a hæmatocoele sac were removed.

Treatment of Myoma complicated with Pregnancy.

The entire question of the practicability of operation during pregnancy, either for ovarian or fibroid tumour, has undergone a remarkable change in recent years, and both ovarian and parovarian cysts, uterine myomata and various diseased states of the adnexa, have been operated upon during this complication. Dealing only here with fibro-myoma, the following broad principles may guide us in deciding whether or not to interfere. We do not meddle with a pregnancy proceeding safely in the presence of a tumour which can be disposed of as the pregnancy advances, such as a pediculated fibromyoma, a small subperitoneal cervical growth, or intra-ligamentary growths. We do not interfere with comparatively small tumours, especially if of the intra-mural kind. Only when serious complications arise during the pregnancy which threaten the life of both mother and child, or when the tumour is so situated that

its removal offers the best chance of saving both lives, while non-interference risks both, should operation be attempted. Where such a probable gain cannot be hoped for, the best course is to wait for labour and perform Cæsarian section.

Question of Operation.

Kelly lays down the rule that we should 'always remember that two lives are involved, and if possible save both, rejecting all radical measures unless the symptoms are urgent. Mere prophylaxis—that is to say, operating when there are no urgent symptoms on account of dangers which may arise—has no field here.'

Small and medium-sized fundal fibroids, intra-ligamentary and subperitoneal cervical fibroids, not large enough or so placed as to cause dystocia or prevent labour, and pediculated fibroid tumours which can be pushed up into the abdomen, do not justify interference during pregnancy, while interstitial tumours should not be touched save as a *dernier ressort*, as abortion almost necessarily follows their removal, though extreme pain or rapid growth may compel interference. A pediculated fibroid projecting into the vagina may be safely removed. In short, when a tumour is so situated that its removal offers the best chance of saving mother and child, while non-interference endangers the lives of both, operation should be attempted. Otherwise we must wait for labour and perform Cæsarean section, followed by hysterectomy. The need for this latter step will depend, Kelly points out, upon the nature of the tumour or tumours, whether these may not be subsequently removed by myomectomy without ablation of the uterus.

With regard to myoma and pregnancy, Pozzi, at the International Medical Congress, Paris, 1900, stated that in five years he had seen eighty-three cases of myomata in twelve thousand and fifty confinements. He had performed major operations in four cases, operating only under very special circumstances, and regarding neither the size nor the situation of the tumour as an absolute indication; and Hofmeir, after a special study of the effects of myoma on conception, pregnancy, and labour, came to the conclusion that a myoma hinders pregnancy very little, and does not frequently affect the course of the labour. Operative interference during pregnancy he considers to be seldom required, and can only become necessary at its termination. With proper precautions the labour is nearly always accomplished safely.

Thumin,* from all the cases published since 1885 to 1902, found that the mortality of abdominal total pan-hysterectomy for myoma complicating pregnancy was 8·9 per cent., and supra-vaginal amputation 11 per cent. Pinard, whose opinion is specially valuable,† deprecates any surgical interference for such tumours during pregnancy, except when serious accidents force the hand of the operator. At the Baudeloque clinic, out of 25,000 parturient women, 85 had uterine myoma. Only twelve were operated upon, and nearly all went their full term. After rupture of the membranes, if difficulties arise he advises Cæsarean section and Porro's operation or total hysterectomy.

Later still, in the discussion at the American Gynæcological Congress (June, 1903), Coe classified cases under three heads: (1) Those in which pregnancy would doubtless go to full term with the prospect of a normal delivery, and

* *Archiv. f. Gyn.*, bd. lxiv., Heft 3.

† *La Gyn.*, Oct. 15, 1901.

in which the treatment was entirely expectant. (2) Those requiring constant observation with the possible anticipation of the date of normal delivery. (3) Those in which there was considerable risk to the mother or child, or both, before and during labour, and requiring surgical treatment either conservative or radical.

He advocated the adoption of these lines of treatment: For fixed fibroids low down in the pelvis, the emptying of the uterus and subsequent myomectomy. Unless urgent symptoms, arising from signs of cardiac, renal, pulmonous or interstitial complications, were present, sessile tumours should not be removed. Only when they threatened life should radical measures be taken. He advises in such cases the induction of labour at the thirty-fifth or thirty-sixth week, but after the eighth month action should be deferred as long as possible before an elective section be made. The general trend of opinion was on the lines above indicated, and several speakers, as Reynolds, Pryor, and Englemann, emphasize the need for recognition of the softening process which occurs in the tumour *pari passu* with the progress of the pregnancy. On the whole, the operation of myomectomy was preferred to hysterectomy.

The experience of Donald* is practically similar: 'In most cases it is better to wait till term. If interference be imperative, the choice lies between hysterectomy and myomectomy. Cæsarean section, a Porro, or hysterectomy, are the alternatives at term.

Carstens, on the other hand,† argues that all tumours likely to interfere with labour should be operated upon, as there is less danger in their removal during pregnancy than non-interference, and letting the woman go to full term, all tumours taking on a rapid growth during pregnancy.‡

As bearing on the practical point of dilatation of the cervix uteri when a myoma complicates pregnancy, and where such further complications as albuminuria, eclampsia, or any form of contracted pelvis is present, it is a matter of vital moment to be able to dilate the cervix to the point of safe instrumental delivery. To do this rapidly, and with safety to the integrity of the uterus and the presenting part of the fœtus, must be our aim when from any of these complications we have to empty the uterus. For this object the instrument devised by Bossi is most valuable.

Its construction can be understood from the accompanying drawing. It will be seen that it consists of four branches, or blades, which, when approximated, form a single grooved end about $2\frac{1}{2}$ inches in length. This can easily be inserted into any patulous cervix. The grooves prevent it from slipping in the cervical canal. By the construction of the instrument, the screw moves the branches synchronously. Without entering into the details of its mechanism,

* *Lancet*, June, 1901.

† *Amer. Jour. Obst.*, March, 1903.

‡ Two interesting cases of abdominal hysterectomy for myoma complicating pregnancy are recorded in the April number of the *Journal of Obstetrics and Gynæcology of the British Empire*, by Florence Boyd.

it is sufficient to say that when the wheel-handle is rotated the blades can be made to diverge to the extent of eight or more centimetres, while the dilatation is measured by a pointer and scale, showing the extent to which the branches are separated.* Bossi's original instrument has been modified by Preiss, and later still by Frommer. Fig. 299 shows Preiss' instrument, side by side with Frommer's. When dilatation has proceeded up to a certain point, the dilator is withdrawn, and the shields are placed on the branches. These are again approximated, and reintroduced into the uterus, when the dilatation is proceeded with. There should be no hurry in the dilatation, the instrument being worked slowly and with periodical rests. Complete aseptic precautions are taken before using the instrument.

Myoma complicating Pregnancy, with Albuminuria.—As it was the first occasion in this country in which the dilator of Bossi was used,† and as the case in which I then employed it exemplifies the value of the instrument, I give the details here.

A lady, early in the seventh month of pregnancy, was attacked with somewhat severe hæmorrhage. She had been suffering from albuminuria for some time, and this had increased until the urine was almost solid on boiling. There were no uræmic symptoms, nor any cerebral or visual disturbances. Hæmorrhage recurring, with attacks of syncope and sickness, while the foetal pulsations and projections were absent, rapid dilatation and delivery of the child was determined upon. Under anæsthesia, the patient was carefully prepared, and the vagina sterilized. The fundus of the uterus was found to be myomatous. In twenty minutes, without any lesion of the cervix or rupture of the membranes, dilatation was effected to the extent of six and a half centimetres. The myoma prevented further dilatation. The presentation was that of an arm, with the head lying in the left iliac fossa. As it was found impossible to move the presentation, the membranes were ruptured. In the attempt to bring the head into position the arm came down, with

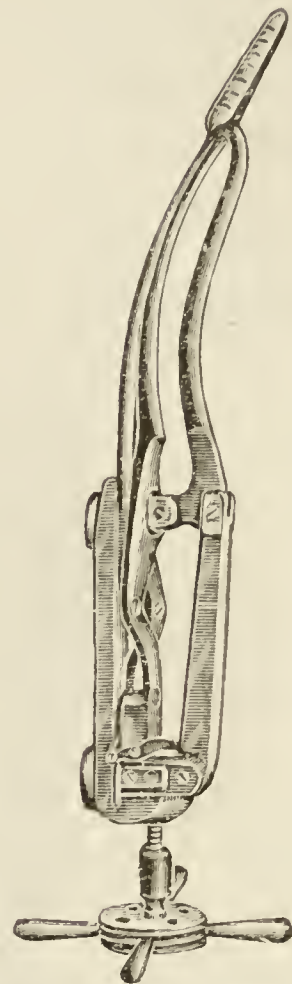


FIG. 298.—BOSSI'S DILATOR.

* Professor L. M. Bossi, *Sulla Dilatazione Meccanica Immediata del Collo dell' Utero nel Campo Ostetrico Annali di Ostetricia e Ginecologia*, 1900.

† *Brit. Gyn. Jour.*, Feb., 1902; *Lancet*, March 1, 1902.

a loop of the funis. In consequence of the impossibility of introducing the hand into the uterus, the greatest difficulty was experienced in effecting version. By pushing back the arm and raising the head, the foot was ultimately secured and version effected. Great difficulty was also experienced with the after-coming head, which was finally delivered by using the blade of a forceps as a vectis. The placenta was shortly afterwards delivered. The fœtus was discoloured, and decomposition had set in, with attendant desquamation. There had evidently been placentitis, with exuda-

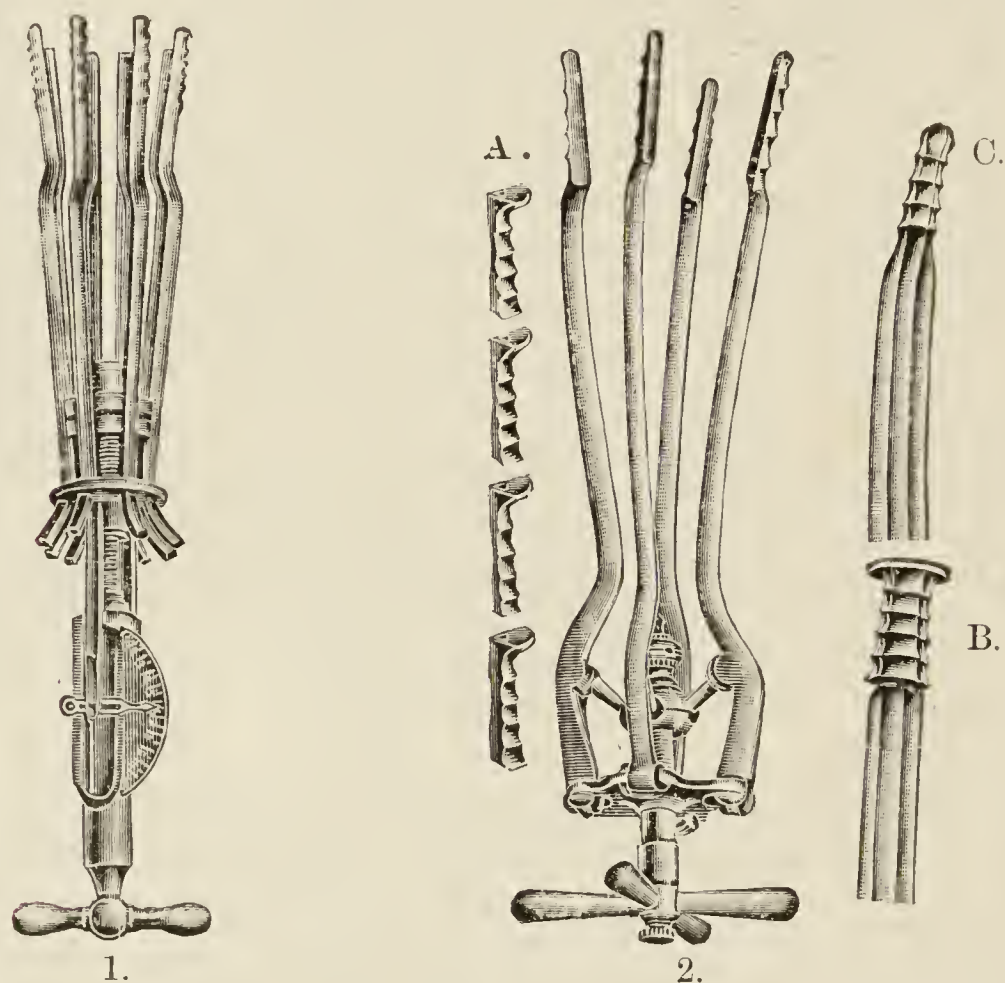


FIG. 299.—FROMMER'S (1) AND PREISS' (2) MODIFICATIONS OF BOSSI'S DILATORS. The former has *eight* detachable blades, thus enabling the operator to regulate the number in use at any time during the dilatation. A, shields for the ends of the blades; B, the blades closed with the shields on; C, the blades closed without the shields. Personally I prefer the original Bossi's or Preiss' instrument.

tions in parts and degeneration, causing in one portion a rather large separation, with resulting extravasation. Fearing that there might be portions of placental tissue remaining, the uterus was several times explored with an ovum forceps, and some placental *débris* was removed. The uterus was then douched out with formalin solution. Two slight lacerations caused by the delivery of the head were secured with cumol gut, and the vagina was loosely tamponed with iodoform gauze. The whole time occupied from the commencement to the close of the operation was exactly one hour.

CHAPTER XXIV.

UTERINE NEOPLASMS—MYOMA (continued). SURGICAL TREATMENT.

Methods of and Indications for Operation.

It would serve no useful purpose in this work to enter into a historical *résumé* of the gradual development of the present-day methods of the operation of hysterectomy, from the time when Charles Clay, in England (1844), performed it first, to the latest technique of the operation. Within the last ten years some operative procedures have become practically obsolete, not only in this country and America, but in all the principal clinics of Europe. I do not, therefore, occupy space in describing these methods. The names of Hegar, Lawson Tait, Schröder, Olshausen, Sänger, Wölfler, and Hacker are those of the pioneers in these various extra-peritoneal and mixed techniques. Though interesting from the historical point of view, they have become obsolete as modern surgical methods.

Classification of Methods.

I must limit the discussion of the surgery of uterine myoma to the procedures which are now more generally adopted by gynæcologists and those which I myself follow. We may divide these procedures thus:—(1) Operative measures for restraining hæmorrhage and arresting the growth of the tumour. (2) Operations for conserving the uterus while removing the myoma or myomata. (3) Operations for removal of the tumour without opening into the vagina. (4) Operations for removal of the entire uterus and the adnexa: (*a*) abdominal pan-hysterectomy; (*b*) vaginal pan-hysterectomy. (5) Operations for removal of tumours of the broad ligaments and adnexa, in which the uterus may or may not have to be removed.

The form of operative measure pursued for the treatment of a uterine myoma, whether it be a single tumour or of the multiple

nature, will, as we have said, depend upon the characteristics of the growth or growths which have to be removed. It may be well to summarize these various procedures, beginning with those which do not interfere with the uterus itself. It is not possible to define, nor indeed, from what has been already said, can we accurately differentiate, the exact indications for any special surgical method of dealing with myoma. Some broad limitations there are to the choice of each particular method, and these may, for practical purposes, be appended to each.

Operative Measures for restraining Hæmorrhage and arresting the Growth of the Tumour.

Ligation of the uterine and ovarian arteries.

Salpingo-oöphorectomy.

In cases in which hæmorrhage is the principal source of danger in the earlier days of the growth of the myoma, and when a patient will not consent to any more serious operative procedure, ligation of the uterine and ovarian vessels, as first advocated by Robinson and Martin of Chicago, may be practised with a view to checking hæmorrhage and increasing atrophy of the tumour.

Salpingo-oöphorectomy is still performed in specially selected cases, though not to the same extent as it was some time back. Speaking generally, it is only indicated in the case of—

- (a) Comparatively small tumours ;
- (b) Rapidly growing tumours in women under thirty ;
- (c) Small interstitial fibroids ;
- (d) Intraligamentary fibroids in their early stages ;
- (e) When under such conditions there is uncontrollable and persistent hæmorrhage of a dangerous nature ;
- (f) When the patient will not consent to hysterectomy, and where the hæmorrhage is severe.

It should not be performed when the tumour is large, fibro-cystic, or pediculated, and it is contra-indicated in serious adnexal complications with inaccessible ovaries and tubes.

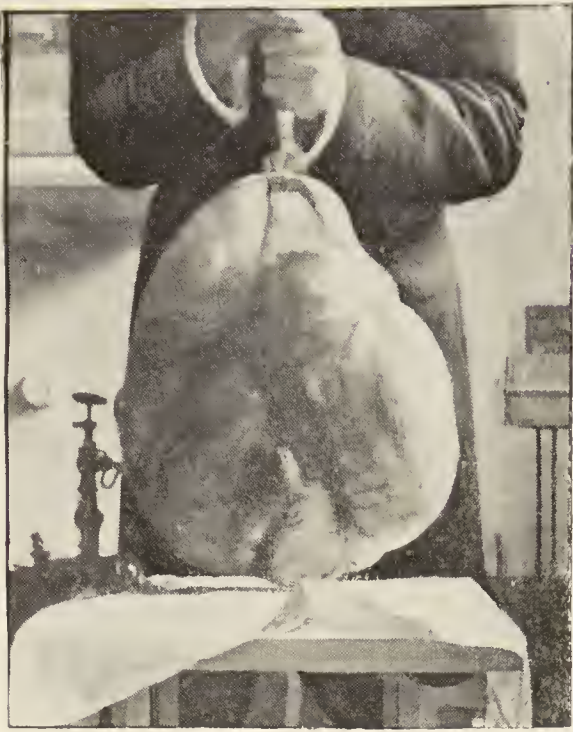
Operations for conserving the Uterus while removing the Myoma or Myomata.

Myomectomy and myotomy :

- (a) Abdominal ;
- (b) Vaginal ;

Myomectomy with morcellement.

PLATE XXXIX.

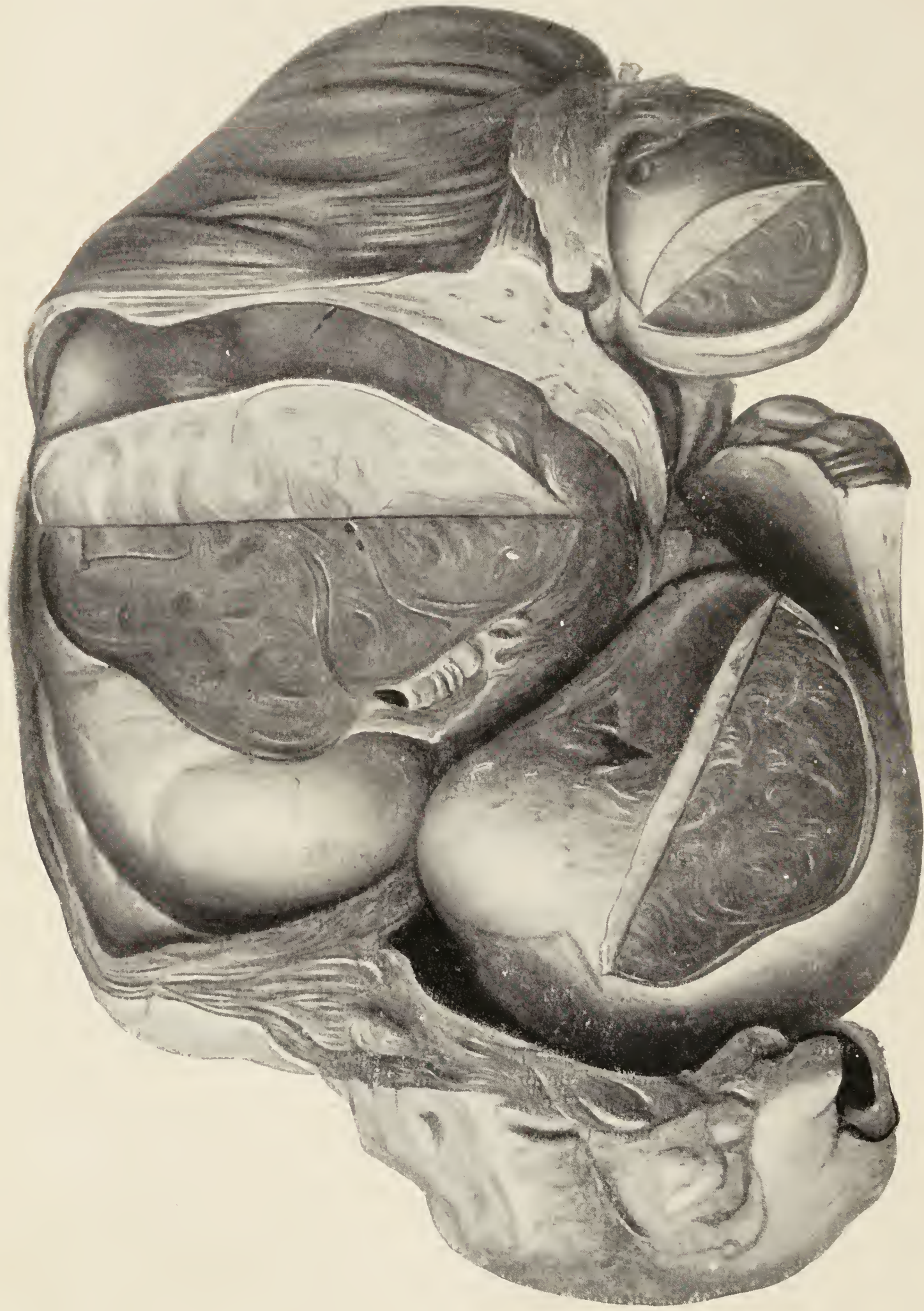


GIANT FIBROMYOMA.

The patient from whom the tumour was removed was a multipara, aged 50. Her last pregnancy occurred eleven years previously. She had never suffered any particular pain, and could not date the commencement of the growth, which she had only noticed some two years before I saw her in 1898, and only within the last few months had there been a rapid increase in size. The periods had been irregular in occurrence and quantity, and there was a considerable loss a few days before operation. On examination a large movable abdominal tumour was found, semi-solid to the touch, and associated with the uterus, the cavity of which was over five inches in length. The abdomen was enlarged much beyond the size of the full term of pregnancy. The patient was fully aware of the risk connected with the operation. The enormous tumour was found to be free from adhesions, and was delivered through an incision reaching from below the ensiform cartilage to the pubes. A broad pedicle attached it to the left broad ligament, and there was a separate attachment to the uterus. The capsule having been completely detached by a circular incision and stripped down, the attachment to the uterus was secured and supra-vaginal hysterectomy completed. The large broad ligament pedicle was then ligatured in segments and the tumour was detached. After removal it was found that the bladder had been opened. The wound was closed by catgut sutures and a catheter was retained. The operation lasted altogether two hours, and during the last half-hour sub-cutaneous (sub-mammary) injections of artificial serum were maintained. The anæsthetic given was chloroform. There was dangerous collapse on the delivery of the tumour, and again towards the close of the operation. As there was some bleeding from the bladder, it was washed out at intervals with a solution containing 30 minims of liquid extract of suprarenal capsule. The tumour proved to be a solid fibromyoma, and it weighed $28\frac{1}{2}$ pounds. Its size and shape can be estimated from the accompanying illustrations taken from photographs (Plate XXXIX.). The table on which the tumour rests measures 16×16 inches. (The uterus and adnexa are not shown.) The patient is in excellent health.

[To face p. 446.]

PLATE XL.



MULTIPLE MYOMA, SHOWING ENCAPSULED NUCLEI, IN A PATIENT AGED 55, AFTER TWO ATTACKS OF PERITONITIS. Removed by supra-vaginal hysterectomy. Patient had a severe attack of cellulitis, rising almost to level of umbilicus in

Myotomy is applicable to certain cases of intra-uterine or sub-mucous myoma, the attack on the tumour being made from the cervix to the vaginal side. Morcellation may be combined with the myotomy, where the tumour proves difficult of isolation, and in the case of larger and more friable growths. Ligation of the uterine vessels, after separation of the bladder and detachment of the peritoneum, may be necessary steps in the operation. Pediculated myomata are treated by myomectomy. William Alexander has succinctly summarized the indications for enucleation.

‘(a) Tumours producing any serious signs or symptoms of disease, crippling the patient, and interfering with marriage, pregnancy, or happiness.

‘(b) When such tumours are solitary, or not exceeding three or four in number, and all are capable of being removed through one incision into the fundis uteri.

‘(c) When the uterus and appendages are sufficiently healthy to perform their functions enucleation should, when possible, be performed.

‘(d) The size of the tumour or tumours does not signify, provided that a healthy uterus can be left behind.’

The advantages of enucleation over hysterectomy in suitable cases are—

‘1. It is not a deprivative operation, and hence it can be performed earlier when patients are only crippled or worried by the disease, and before dangerous symptoms set in.

‘2. The shock of operation and risks to the patient in these early enucleations are much less than in hysterectomy later on. The mortality is not more than two per cent.

‘3. Marriage, pregnancy, and parturition are possible, and relief will be accepted by patients in this way who would continue to suffer rather than have hysterectomy performed, or their ovaries removed.’

Operations for removal of the Tumour without opening into the Vagina.

Supra-vaginal Hysterectomy—Hystero-myomectomy (Kelly).—This operation, which is generally associated with Howard Kelly’s name, involves the abandonment of the cervix uteri, and may or may not involve the removal of the adnexa of one or both sides, according as they are diseased or otherwise, and as the operator deems it

advisable for physiological or clinical reasons. The classical condition which indicates it is a myoma of any size uncomplicated by extensive adnexal adhesions, suppurative states of the adnexa, diseased conditions of the cervix, degenerative changes in the tumour involving the cervix, any suspicion of malignant change, and intra-ligamentary tumours. It has the advantage of a simpler and more rapidly completed technique, and the vault of the vagina is preserved intact. It has the disadvantage of leaving the cervical stump, which is liable to various degenerative changes in the future, and possibly those of a malignant nature. There may also be risk of sepsis through the infected cervix and the want of drainage. Though on the whole there cannot be said to be as great risk of sepsis as in the pan-hysterectomy operation, this and the next operation may have to be completed by bisection of the uterus.

Operations for the Removal of the Entire Uterus and Adnexa.

Pan - hysterectomy (Cœlio - salpingo - oöphoro - hysterectomy) Abdominal Pan-hysterectomy.—This is the most complete and perfect of all operations for the removal of myomata. It is more specially called for where there are tumours which involve the broad ligaments, and in which the cervix participates in the myomatous change. It is also the operation for myomatous tumours complicated by suppurative states of the ovaries or tubes where there has been serious perimetritic inflammation resulting in adhesions of the pelvic viscera; where there are cystic, necrotic, suppurative, adenomatous, or malignant degenerations of the myoma, especially if these involve the cervix. Hegar * thus puts it:—

‘ Abdominal total extirpation is indicated in complicated cases, such as those in which the tumour lies partly in the smaller pelvis, develops and unfolds the peritoneal layers of the lower portions of the broad ligaments, extends as far as the lateral, or even the posterior wall of the pelvis, approaches the hypogastric vessels or the ureters, elevates the back part of the broad ligament, or separates the mesentery, so that the sigmoid flexure on the left and a loop of small intestine on the right lie across the tumour. The branches of the uterine arteries are often thrust asunder and some pushed forwards and others backwards. Occasionally, to obtain a better view, one is obliged to take away individual nodules or sections of the growth. If changes have taken place in the tumour, such as effusions of blood, necrosis, or cystic degeneration, there are often also very extensive adhesions rich in blood supply, especially to the omentum. Finally, pathological changes in the adnexa are by no means rare. Under such circumstances the operation cannot be done quickly, but is

* *Münch. m. Wehns.*, 1902, No. 47..

nevertheless especially indicated and has many advantages over any other method.' Bisection of the uterus is frequently a step in this technique.

Vaginal pan-hysterectomy performed by the vaginal route is, with a number of gynæcological surgeons, regarded as the classical method of removing a myomatous uterus. The grounds on which they arrive at this decision are, that the operation itself is less formidable, there is less exposure of the bowel and peritoneal cavity, less danger of sepsis, less shock, and, when necessary, drainage is more easily secured. The operation is specially indicated in the case of a comparatively small myoma under the size of the foetal skull at full term, in which we have no broad ligament complications, nor serious adnexal complications or adhesions. It may be performed by means of *ligature*, *ligature* and *angiotripsy*, or with various kinds of *clamp*. Pan-hysterectomy is also performed by means of electro-hæmostasis (Skene and Jacobs).

Operations for Removal of Myomatous Tumours of the Broad Ligaments and Adnexa in which the Uterus may or may not have to be Removed.

Decortication.—This operation may be performed alone, or supplemented by supra-vaginal hysterectomy. It is especially applicable to tumours springing from the broad ligaments and adnexa. Peeling off the peritoneal covering, resection of the tumour, closure of its bed by sutures; drainage either by the vagina or the abdominal wound, according to circumstances, such as the size of the tumour and its attachment or proximity to the uterus.

Mortality and Risk of Operation.

It would serve but little useful purpose to enter into the various disputations and statistical records of different operators, whether Continental, American, or British, on the comparative advantages of this or that method of removing uterine fibromata. The results arrived at by the most eminent surgeons, by what they assert to be the same method of operation, prevent any definite conclusion which can be drawn from statistical records. This is only what we may expect when we recollect the intrinsic difficulties and differences arising in all of these operative procedures. Obviously, the exact suitability of this or that method to any individual case must vary according to the nature of the tumour and the local complications. A general survey of experiences of a large number of operators, and

the results of some thousands of cases, shows that the special applicability of any mode of manipulation must be determined by, and made subservient to, the particular necessities of the type of tumour which is at the moment being dealt with.

The main aims of all operators, and in every abdominal operation, can be summarized as follows :—

Essentials to aim at.

(a) Reduction of the time of operation to the lowest possible period compatible with its complete performance.

(b) Protection of the bowel from injury, and possible subsequent adhesions and consequent obstruction.

(c) Complete hæmostasis.

(d) The prevention of shock.

(e) Avoidance of injury to the bladder and ureters.

(f) Thorough asepsis before, during, and after operation.

Whichever operation, to the surgeon's mind, covers these safeguards most completely from the risks inseparable from the performance of most grave cœliotomies or vaginal hysterectomies, is the one that he should select, and there is the further important consideration that he alone knows the kind of procedure in which he has the greatest confidence in his own operative skill to complete, of which he has the largest experience, and which he personally believes will give to that particular patient the largest proportion of chances of satisfactory recovery.

In earlier editions of this treatise the question of the statistical evidence as to the relative mortality of extra- and intra-peritoneal operations was fully discussed. The work which has been done has of late years conclusively shown that the various intro-peritoneal operations performed by the vaginal, celio-vaginal, and supra-vaginal methods are the safest, that they are capable of such modifications of technique as may be demanded by the peculiar conditions of the tumour, and also afford the surgeon the greatest security for the successful accomplishment of those important, if not vital, objects just enumerated. We are justified in arriving at such a conclusion from a scrutiny of the results achieved by a host of distinguished surgeons who have practised both procedures.

Within the last few years the mortality has decreased relatively with the improved aseptic and antiseptic precautions, more careful diagnosis and selection of cases for a given procedure, more perfect peritoneal adaptation and adjustment, more rapid and complete

hæmostasis, less frequent use of the drainage tube, and a better differentiation of the cases in which drainage is indicated.

The mortality by any method of operation will depend upon the conditions and complications met with in the cases operated upon. The difference in the risks between various cases is great, and cannot often be determined before operation. Therefore, in stating such risk to the patient, as should always be done, a margin must be allowed for unforeseen accidents and obstacles. Allowance, too, must be made for extra danger in the case of very large tumours with ascertained adhesions situated deeply in the pelvic cavity, and involving the adjacent viscera.

Idiosyncrasies and temperament must also be well weighed, and the presence of any constitutional vice or lesion of the lung or kidney inquired into.

In the face of such conditions as cardiac disease, chronic asthma, general atheroma, or renal disease, the surgeon will pause before advising hysterectomy.

The mortality returns of the most expert operators vary widely, and we may take it that the risk involved in the most perfect removal of non-pediculated fibromata ranges from 4 to 10 per cent. In certain pediculated cases, where the difficulty is not greater than that involved in an ordinary ovariectomy, the risk is not more than in the latter operation, say 2 per cent. The truth is, that each individual case of myoma has associated with its removal its own particular danger, and it is wrong for any operator, on the ground of any favourable statistical table or successful run of operations, to minimize this danger to his patient. The probable risk in the case of the particular tumour under discussion is what he has to forecast; not what is the percentage risk of the operation in all cases.

Symptoms Demanding Operation.

It must ever be of importance to the practitioner to recognize those symptoms on the presence or recurrence of which he will recommend or acquiesce in so serious a step as hysterectomy. There are clear cases in which there is no choice save operation, when life is seriously threatened, either by the large size of the tumour, pelvic complications, pressure on the ureters and rectum, severe hæmorrhage, great suffering, suppuration, or interstitial changes in the tumour. The decision or the justification for operation for a fibroid tumour must depend on the answer to these questions. Is the

tumour at the moment a source of immediate danger to the life of the woman : does it, by its rapidity of growth, its size or position, or the symptoms that it causes, render it more than probable that the pursual of an expectant attitude will expose her to greater risks than those that must be incurred by the operation on the particular tumour in the individual case before us ?

We are not justified in advising operation if we do not conscientiously feel that the danger of interference is at least not greater than that which would follow non-interference. The considerations to which weight has to be attached in arriving at a conclusion are the presence, constant or periodical, of pain that no treatment can alleviate ; the obvious evidences in the woman's appearance, and from her history, that the tumour is gradually but certainly undermining her health ; that her social position is such as to prevent her taking advantage of palliative means of treatment, and that she is unable to support herself or her family by her personal exertion. A tumour that may be well borne and temporized with in the instance of one woman, will demand in the other operative interference for the earning of her daily bread and domestic considerations.

Early Operation.—The determination of early operation after the discovery of a fibroid tumour of the uterus will depend upon its position, size, comparative facility of removal by such means, for example, as myomectomy, or vaginal hysterectomy, or its treatment by ligation of the uterine arteries, or salpingo-oöphorectomy.

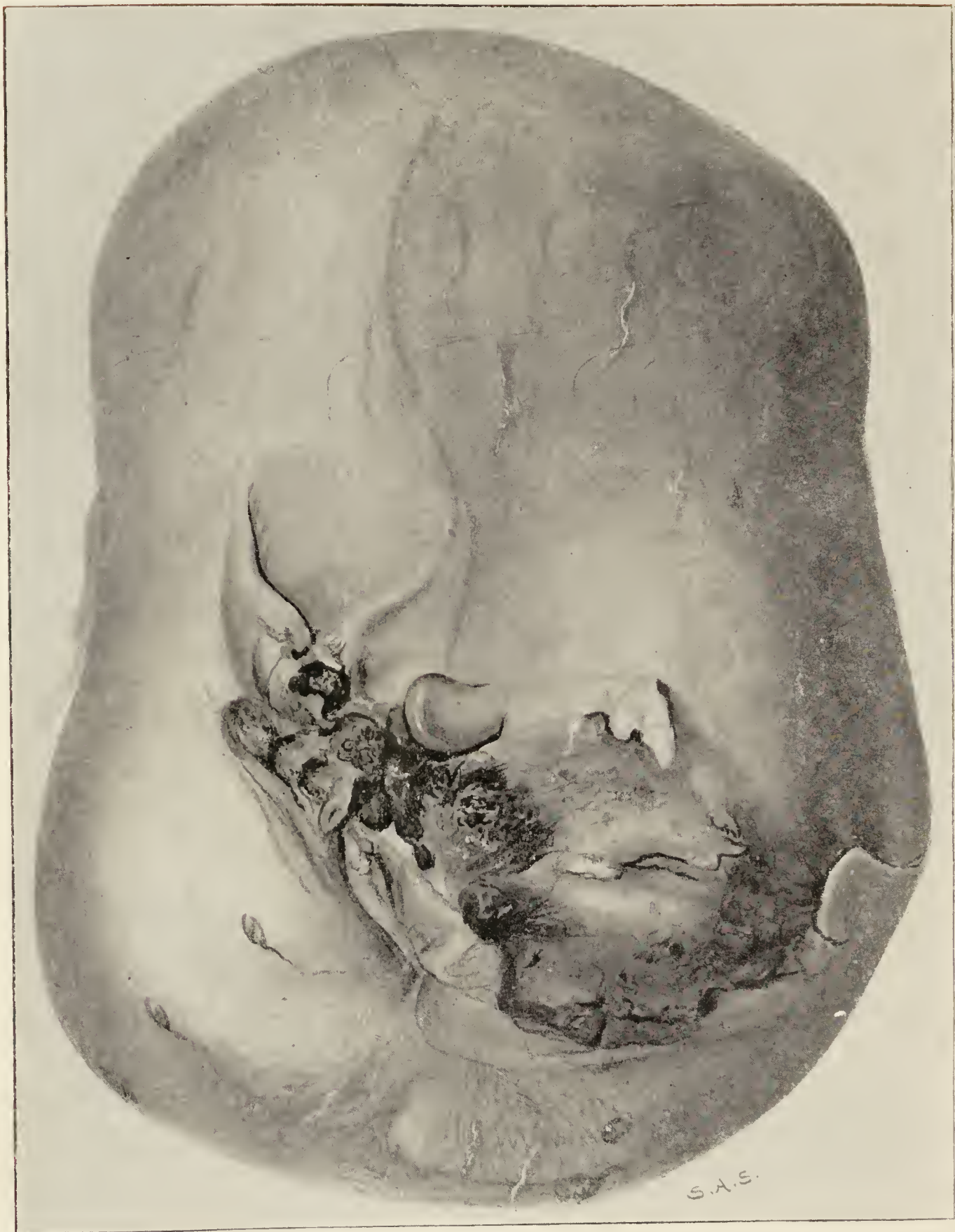
The tumour may complicate retroversion of the womb, may be connected with disordered mental states, and be found associated with morbid conditions or tumours of the adnexa. Such complications may demand its early removal. What must be insisted upon is, that the mere presence of a fibromyoma does not justify an operation. It may happen that a comparatively large tumour can with safety be temporized with, while a relatively smaller one must be removed. The fact cannot be overlooked that most women who suffer from tumours of the womb or the adnexa are more or less invalids. Discomfort, inability to walk, pain, hæmorrhage, constipation, bladder troubles, mental distress and apprehension, deprivation of social enjoyments, incapacity for fulfilling ordinary duties or those demanded by occupation, are common consequences.

The majority of women who suffer thus will themselves demand that relief afforded by operation, even when distinctly told the maximum risk which they have to run in order to be cured.

The old idea of waiting for the menopause in order to give the



PLATE XLI.



LARGE DENSE FIBROMA, OF STONY HARDNESS, FILLING THE PELVIC CAVITY, AND
FIXED BY ADHESIONS TO THE RECTUM AND FLOOR OF THE PELVIS. (AUTHOR.)

(Case referred to p. 453.)

[To face p. 453.]

tumour a chance of disappearance, has long since been exploded. All the risks of the approaching menopause are increased by its presence, and its dangers are accentuated. Of this fact there are some striking examples in these pages. This has to be said on behalf of the advocates of hysterectomy in the early stages of the growth of fibroids, that the dangers attendant upon operation would be considerably diminished by their removal when of small size.

Here the operation of selection undoubtedly is myomectomy, if the tumour or tumours be suitable. The present trend of opinion is in the direction of early removal by the vagina of growing interstitial fibromata to which other procedures are not applicable in the most favourable circumstances.

In any case the risk involved, whatever operation be performed, should be fairly placed before the patient. If it has to be done under circumstances that render it exceptionally dangerous, the percentage of deaths from interference *in that particular type of case* should be explained to her. This is my practice, and I may illustrate it by the following example :—

A lady consulted me who had suffered from a fibromyoma for some years. She was then anæmic, rather emaciated, and of a highly nervous and hysterical temperament. She suffered constant pain, and was unable to walk any distance. Active hæmorrhage had ceased. The summit of the tumour reached nearly to the umbilicus, and completely filled the pelvic basin. She had been seen by other gynæcologists, who had decided that though operation was the only course open, the risks were so great that it could not be advised. I told her that *at least* one woman out of every ten operated upon would die from the operation itself; that I advised interference, seeing the certain dangers which would arise if nothing were done to relieve her, but that the decision should rest with herself. She resolved to have the operation.

The tumour (Plate XLI.) was readily exposed, and the cause of its fixation in the pelvis discovered to be adhesions which bound it deeply and posteriorly. When these were freed with the hand, the tumour was delivered by the helioid. The patient made an excellent recovery.

It is interesting to note what a distinguished woman gynæcologist has to say in this connection.* ‘I do not believe a woman can have a fibroid tumour, however small, without having direct and sympathetic trouble, for the tumours not only may produce various uterine displacements, with their accompanying evils and distresses, but they encroach upon normal structures, derange, change, and destroy it, disturb normal functions, are a constant irritation to the organic system of the uterus, and, by sympathetic troubles and reflex irritations, the injuries they produce are more than we can measure or calculate. They render the whole being physically and morally incompetent, nature is intolerant of them, and the patients are worn out by the disorders resulting from them.’

* Mary Dixon Jones, in the *Brit. Gyn. Jour.*, Feb. 1898.

She further contrasts the burden of a child in utero in its psychical and physiological effects, with those attendant upon the dead burden of a fibroma. 'No hope of relief, no anticipation, only a sickening prospect, gloomy forebodings, and the saddest possibilities.'

Dr. Mary Scharlieb, the distinguished operating gynæcologist, accepts as indications for operation such present conditions as hæmorrhage, pain, pressure on the bladder, ureters, and rectum, invalidism, and the possibility of future degeneration, and her practice is in accord with her expressed opinion.*

A. Martin says, 'No one denies that, especially under the influence of some well-known iodine waters, climacteric involution, which must be considered as a cure, may develop in a fateful and even premature manner; nevertheless, in discussing the indications for operation, other points are admittedly quite decisive; when the tumours are comparatively small, the danger of interference is materially less, and, a more important point, it may then be possible to remove diseased tissue only, and to save a portion of the uterus capable of its functions. No one denies that this way of operating has proved full of blessing, and as the prognosis of operation is constantly improving, the advances in asepsis and technique allow us to hope that the propriety of early interference, as soon as good health and capacity for work are permanently disturbed, will be more and more generally recognized, for there is no other treatment of the myomatous uterus by which the patient can be protected from further and more serious troubles.'†

Medium-sized and even small tumours, from their position and nature, may have to be removed on account of their encroachment on the bladder and the consequences of pressure, as in a case I have recently operated upon, in which the bladder was adherent for a considerable distance to the face of the tumour. Extremists may say 'that all fibroid tumours, large or small, should be removed, as they are always a source of danger and of dangerous possibilities.' An axiom so comprehensive few gynæcologists will agree with, even though the enunciators of it quote in support of their statement the fact that Thomas Keith performed hysterectomy for a uterine fibroid that weighed 1 lb., and that A. Martin operated for a tumour the size of an apple. It is well known how conservative in regard to interference was that most distinguished of Scottish gynæcologists, Thomas Keith, in his later writings with regard to hysterectomy, but the mortality then was, as has been well said, nothing short of 'fearful.'

Finally, it may be permissible here to repeat what I have elsewhere said on this important question:—

Propriety of Operation.‡—'The propriety of the operation has to be determined under so many diverse conditions and circumstances, that our resolve to operate or not must depend upon the special features of the individual case in which a decision has to be arrived at. We have to decide what are the *immediate dangers* attendant upon the tumour in question, whether it be of such a nature as to afford room for alternative treatment, more particularly when

* Brit. Med. meeting, Ipswich, 1900. † *Berliner K. Wehns.*, 1902, No. 19.

‡ 'Practical Points in Gynæcology' (Author), 3rd edit., 1902.

the operative procedures of ligature of the uterine arteries, salpingo-oöphorectomy, or myomectomy are alternatives which are not only justified but indicated. We must fairly judge how far the *character, position, and attachments* of the growth or growths influence the risk, raising it above that which is accepted as a fair average following from the operation in cases which are not of a very exceptional nature. In doing so, we have to apportion as nearly as we can the internal and inherent dangers which are incidental to the tumour itself in its pathological features, as well as its surrounding complications, those present at the time, or likely to follow its further growth and development.

‘The lesson drawn from the case of a woman who determines to bear with her tumour, and put up with the necessary discomfort, or endure chronic invalidism, has no bearing on that of a woman who has domestic or other duties to perform in order to support herself or family, and has to earn her living. If the woman be a free agent, as she should be, it is our duty to assist her to arrive at a conclusion based upon an intelligent and fairly accurate view of the reasons for and against interference, placing before her the dangers of expectancy as compared with those of whatever operation we advise, leaning rather to an exaggeration than an underrating of the latter. This of course refers only to cases in which necessity and urgency do not call for the unqualified advice of immediate operation. Should we counsel postponement, at least in a large number of cases the woman should clearly understand that she undertakes the responsibility for the increased dangers and possible complications resulting from procrastination. Only a comparative few of those who do not suffer from serious complications of the tumour can be said not to be more or less invalids, and we must recollect this when advising in the case of one whose means are not such as to afford her opportunity for palliative treatment and rest.

‘By clinical observation and examination, the presence of the great majority of these complications may be ascertained, and this knowledge will largely determine us in our prognosis and decision as to operation. A tumour in which there is no evidence of any serious degenerative change, which is not complicated by gross changes in the adnexa, which is causing no serious obstruction to the bowel or displacement of the bladder with incontinence or distress, where neither peritoneal nor ascitic complications are present, and the rapidity or the size of the growth has not to be considered, will certainly not demand interference. Such a tumour can have but little influence on the general health of a woman; yet there are some women of the neurasthenic and neurotic temperaments of whom this cannot truthfully be said.’

CHAPTER XXV.

UTERINE NEOPLASMS—MYOMA (continued)— SURGICAL TREATMENT.

Ligation of the Uterine and Ovarian Arteries.

As a substitute both for hysterectomy and oöphorectomy, several surgeons, notably Robinson and Martin, of Chicago, have ligated the uterine and ovarian vessels to check hæmorrhage and induce atrophy of the tumour.

In Martin's operation, the cervix, having been well exposed by retractors, is transfixed with a strong silk ligature, any secretion from the uterine canal

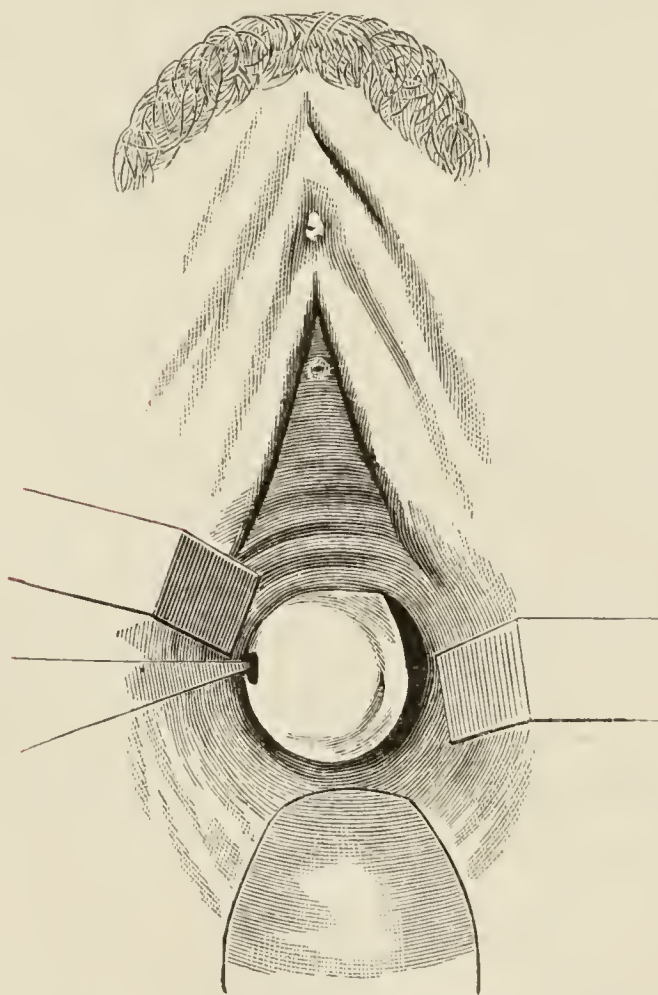


FIG. 300.—SHOWS INCISION OVER LEFT
BROAD LIGAMENT. (MARTIN.)

being restrained by a tampon of gauze, over which the ligature is tied. The uterus having been drawn down, the left vaginal vault is exposed (Fig. 300), and the mucous membrane at the utero-vaginal junction is incised with curved scissors; one blade is then entered, and a curved incision about 2 inches in length is carried over the broad ligament at right angles to it. An index-finger of each hand is now introduced (Fig. 301), and the vaginal tissue is detached from the broad ligament in front of the bladder for a space of 2 inches in height, and the same distance to the side. In doing this the ureter is pushed out of reach. The same plan is adopted posteriorly. The peritoneum is not injured. The base of the broad ligament for a distance of 1 inch to $1\frac{1}{4}$ inches from the uterus is grasped in the manner shown in

the drawing (Fig. 302). Finally, a needle threaded with No. 12 braided silk, guided by the index-finger, is carried behind the broad ligament clear of all pulsating vessels and made to penetrate it.

Thus the base of the broad ligament is ligatured firmly a full inch from the uterus. The ligature is cut short and allowed to retract. The opposite side having been similarly dealt with, both vaginal incisions are carefully closed with catgut, thus completely burying the silk. The cervical handling-string is with-

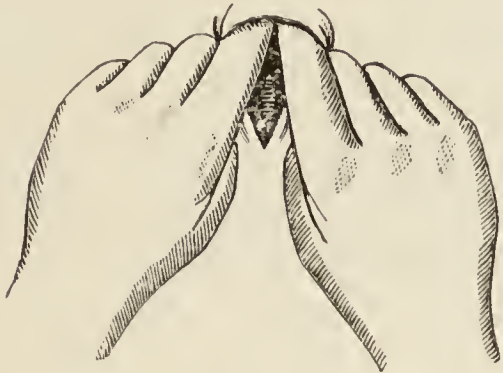


FIG. 301.—SEPARATION OF THE BROAD LIGAMENT WITH THE FINGERS.



FIG. 302.—GRASPING THE BASE OF THE BROAD LIGAMENT.

drawn, and the vagina packed with iodoform gauze. The subsequent treatment is simple. Thorough antisepsis being maintained, the vaginal wound is healed in about a week.

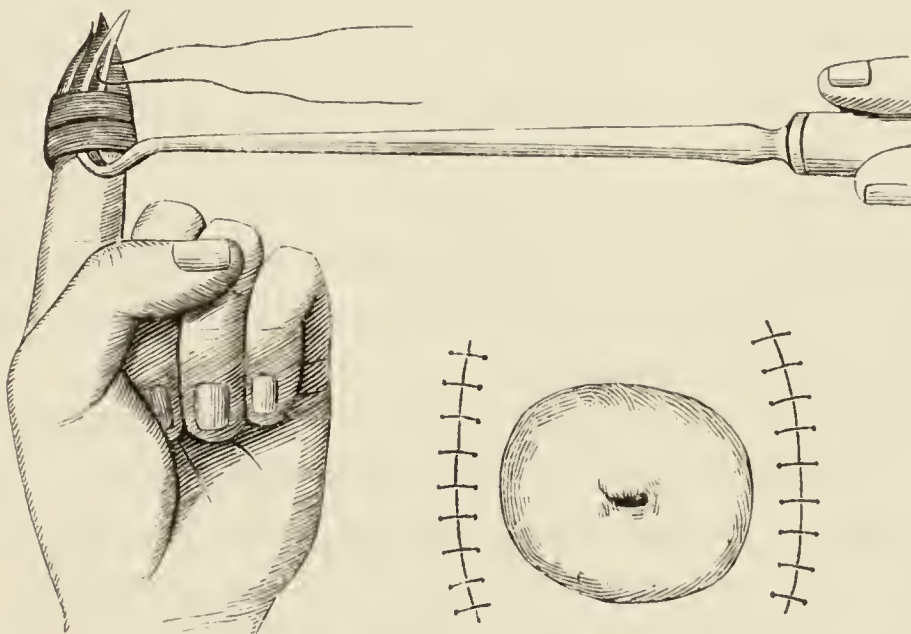


FIG. 303.—LIGATURING BASE OF BROAD LIGAMENT; VAGINAL INCISION CLOSED.

Salpingo-Oöphorectomy for Fibroid Tumours.

The indications for removal of the uterine appendages and the details of the operation for disease of the adnexa will be referred to when dealing with affections of the Fallopian tube and ovary. (See chapter on Affections of the Fallopian Tubes and Ovaries.)

I take this opportunity of objecting to the use of the term 'castration.' In the case of fibroid tumours, the organs that are removed may be healthy, for the operation is performed to bring about the premature change of life. Yet

even in this instance I think it preferable to adhere to the term 'salpingo-oöphorectomy.' In all other cases in which we advise removal of the appendages, we do so for diseased conditions which either directly or indirectly affect the health or threaten the life of the woman. In the instance of fibroids, the removal of the appendages is undertaken for conditions which would, in the vast majority of those who suffer from them, render conception impossible. In most of the cases there are pathological conditions of the appendages associated with these growths. The term 'castration' being allied in the public mind with the deliberate mutilation of the *healthy* organs of generation for the sole purpose of unsexing the man or animal on whom it is performed, the use of it in describing what is in its ultimate aim and object a truly conservative step, the cure or arrest of disease, is misleading. It tends to prejudice an operative step which is, when rightly taken, a most valuable gynæcological procedure.

It is interesting to recall Battey's original statement to the American Congress of 1881 with regard to oöphorectomy for growing or bleeding fibroids:—

'Perhaps no safer rule can be laid down to-day by which one may determine in any given case the propriety of the operation, than by asking himself three questions, namely—1. Is this a grave case? 2. Is it incurable by any of the resources of the art short of the change of life? 3. Is it curable by the change of life? If all three of these questions can be answered affirmatively, the case is a proper one; but if not, the operation is not to be justified.'

Since then, and more especially of late, very different views have been held by leading gynæcologists on the value of salpingo-oöphorectomy for bleeding fibroids.

It is difficult to define the kind of uterine growth which it is right to treat by removal of the adnexa. This arises from the fact that the principal indications for the operation, viz. size and rapidity of growth and hæmorrhage, have associated with them in different women such widely varying conditions, both touching the tumour itself and the patient's health and circumstances, that no rule can be laid down. The involvement of other organs, the nature of the tumour, and the symptoms directly dependent on its size, the patient's age, and the possibility of pregnancy, are among the most prominent facts which must influence our decision. In favour of the operation is the diminution of risk, and the fairly large proportion of cures. Against it are the number of cases in which bleeding continues, and that in some instances myomata grow more rapidly after the operation.

The indications and contra-indications for the performance of

this operation for the removal of a myoma have been already given. Considerable diversity of opinion still exists as to the position this operative step should take in the treatment of a myoma. There are, however, certain cases in which it is not only justifiable, but imperative, to give the patient the chance of relief by this means, even though, as Edge well puts it, 'we are seeking immediate safety rather than theoretical perfection and thoroughness.'

The results of the operation show that in at least eighty per cent. of the cases the menopause is brought about, and that, in ninety per cent. of *thoroughly completed operations*, shrinking in varying degrees occurs, while the general health of the patient is improved. It must also be borne in mind that in a large proportion of patients suffering from fibroid tumour of the uterus there are pathological conditions of the ovaries and tubes associated with it.

Operation of Salpingo-Oöphorectomy (Abdominal)—Position of the Adnexa and Appendix.

Having decided to perform the operation of salpingo-oöphorectomy, we proceed to make a careful examination, both abdominal and vaginal, of the relations of the tumour, and to define as far as possible the existence of adhesions and the position of the adnexa. It must be remembered that this varies in cases of myoma according to the mode of growth of the tumour, the adnexa being displaced in different directions. Sometimes they are found at the summit of the tumour, at others at the lower part of it, or again, behind it. Also they may be fixed by their adhesions to the uterus or the pelvic structures; and oftentimes such adhesions are both extensive and strong, the ovaries and tubes being embedded in a mass of adhesive bands, which half conceal them from view with new tissue formation. There may, too, be solid tumours of the ovary, or old suppurative conditions both of the tubes and the ovaries. Under anæsthesia we can frequently determine beforehand the presence of such conditions. On the other hand, the adnexa are frequently readily accessible, being carried upwards by the tumour. It is well also to remember that the appendix may be involved through old adhesions, and its position altered, being attached to the tumour, or to some portion of the right adnexa, while the sigmoid flexure is likewise displaced or attached at the left side. Omental adhesions are not uncommon.

Operation.—The patient is prepared as usual for cœliotomy, and, if obtainable, a table capable of being placed in the Trendelenburg

position is used. It is wise to make a somewhat longer incision than that usually required, and it may be necessary to enlarge this still further if any of the difficulties enumerated have to be met. Small retractors should then be used to hold the margins of the wound well asunder. In making the abdominal incision, care has to be taken lest any portion of bowel should lie superficially over the tumour. Before opening the peritoneum, all bleeding points are secured by pressure forceps, and here those of Zweifel are valuable in quickly and permanently checking the bleeding from small vessels. Search is then made for the adnexa of one side, the broad ligament acting as a guide to the tube and ovary, stretching outwards at either side from the fundus of the uterus. If these be free, they may at once be drawn outside the wound. Should there be fluid present in either tube or ovary, its escape has to be guarded against by means of a piece of sterilized gauze, which is nipped round the adnexa by a pressure forceps. The fluid can then be evacuated by a small trocar or aspirator, at the same time that flat sterilized protectors are used to protect the peritoneum and intestine. Small squares of muslin are easily tucked in, and spread over the intestine, *one protruding end being always caught in a catch forceps*. It is essential to expose the entire Fallopian tube, as no portion of tube or ovary should be left. A portion of the broad ligament devoid of vessels is now pierced with a Deschamp's needle, carrying the loop of gut through. The needle is withdrawn. The loop is divided, and the adnexa are securely ligatured off. When removing them with the scissors, sufficient peritoneum is left to cover the pedicle. A light clamp is now passed below the pedicle, so as to secure it. The peritoneum is reflected back, and a few pieces of thin gut secure separately the ovarian vessels. The peritoneum is then carefully adjusted over the surface of the stump by a continuous suture of thin cumol gut, so as to leave no raw surface. If the method of Tait be followed, a loop of double ligature is passed through the centre of the broad ligament, avoiding the vessels. The loop is then turned back so as to include both the ovary and tube in the two loops thus formed. One free end is next passed through the returned loop, both ends are now drawn tightly, tied, and then cut off (the Staffordshire knot), or the loop is passed through the pedicle and the needle is withdrawn. The loop is now cut, and either half of the pedicle is tied, the several ends are again tied tightly in figure of eight fashion, and the pedicle is cut. The opposite ovary and tube are now treated in the same manner. Dabs, wrung out of

warm formalin solution, are carried by long clamp forceps into the pelvic cavity and the pouch of Douglas, which are thoroughly cleared of all remains of blood. The abdominal toilet is then completed, peritoneum, muscle and fascia, and skin.

Howard Kelly insists that the point of selection for the removal of the adnexa is at the infundibulo-pelvic margin, where nothing is to be found between the layers of the broad ligament, and there is therefore no danger of wounding any large venous vessel. Here the loop of suture is cut when passed, one half being tied over the infundibulo-pelvic ligament, and the other close to the uterine horn. When the tube and ovary are removed, one ligature is drawn towards the pelvic wall, and the other to the cornu of the uterus, while the two layers of the broad ligament lie parallel and in close apposition. Hence, suturing is unnecessary, and there is no space for the strangulation of any loop of bowel, nor is there any pressure on the rectum.

Simple as this operation is in the majority of cases, it becomes quite a different matter if the surgeon has to deal with unexpected difficulties in the pelvis. There may be displacement of the adnexa through the presence of a uterine or intra-ligamentary fibroid; also, adhesions most difficult to detach may be encountered. Again, there may be found a cyst distended with serum, blood, or pus, to the point of rupture, and this may be fixed by adhesion to the bladder or bowel. The safe rules to adopt are, to avoid all hurry, to deal carefully with adhesions, to ligature or control by forceps and ligature all bleeding as we proceed, and to safeguard the operation throughout by the most thorough asepsis.

Bovée* enters a strong plea against removal of the Fallopian tube and ovary *en masse*, and advocates the removal of the ovary and tube thus:—

A small clamp is placed on the infundibulo-pelvic ligament close to the fimbriated end of the tube, and including only the part of the ligament containing the blood vessels; another is placed on the Fallopian tube close to the uterus, but not including the trunk of the utero-ovarian vessels; a third is placed on the ovarian ligament. Then the tube is carefully dissected from the top of the broad ligament up to the forceps clamping it, the wound closed by a continuous over and over suture of catgut and the clamp removed. In doing this, care is needed to coaptate properly the cut edges of the peritoneum. Then the ovary is carefully separated from the broad ligament and the ovarian ligament severed just outside the forceps. This wound is also closed by the same kind of suture and the clamp removed. We have left the short stump of the uterine end of the

* *Amer. Gyn.*, June, 1903.

tube. Traction on the clamp puts the stump on the stretch, and it is cut off within the uterine tissue. The wound is closed similarly to the others, and the work is finished. This method does not include removal of any of the broad ligament, does not shorten it, is accompanied with a minimum amount of traumatism, insures complete ablation of the appendages, and prevents connection between the uterine and peritoneal cavities.

This doubtless is an ideal method, but personally I have never found any ill consequences follow from the technique described in the text. It is impossible to have any hæmorrhage if the pedicles be sewn over and covered carefully with peritoneum.

Should adhesions be present, these must be carefully separated, working with the finger a small dossil of gauze fixed in a clamp forceps. More resistant connecting bands are ligatured and divided, the ovary being raised from any bed of plastic material in which it may be embedded, and care being taken to avoid injury to the bladder or rectum while this is being done. Should pus sacs or cysts be unavoidably opened, and pus or cystic contents escape into the pelvic or abdominal cavity, it is my practice to resort to repeated mopping out of the cavity with moist dabs of sterilized gauze soaked in and partly squeezed out of weak formalin solution. This must be done gently, so as not to tear or injure the omentum, the peritoneum, or the bowel. No drainage is required, as a rule.

Operative procedures on the pelvic viscera and the ever-varying and complex conditions found on opening the abdomen, admit practically of no fixed rule in dealing with them. The true surgical artist is he who, while conforming to broad and unalterable surgical principles, deals with each case and its complications as it presents itself to him at the time of operation, his resources limited by no rigid theoretical consideration, and his hand not held by any authoritative *ipse dixit*. Through such freedom of action can we alone hope for progress, and in no part of the human body is such liberty demanded more than it is in the surgery of the female organs of generation. It were well to bear this in mind in discussions, often futile, on this or that method of procedure, and in disputations over steps of operations, the bearings of which vanish in actual practice, when face to face with unexpected and novel difficulties, where the surgeon has to fall back on his individual judgment and surgical instinct for guidance.

Management of the Pedicle.—Whatever method be adopted, whether that of drawing the peritoneum over the pedicle and suturing it, and thus hiding

it from view, or dissecting a collar from the pedicle and suturing it over the stump, or covering it with the posterior surface of the broad ligament, there can be no doubt that if we want to avoid intestinal complications, adhesions, and reflex nerve symptoms and subsequent complications during pregnancy, the pedicle should always be carefully covered before it is dropped into the abdominal cavity.

Edge, quoting from Bumm,* thus classifies the different methods of covering the pedicle: (a) When the area of the pedicle is small, Condamin† advised that the peritoneum should be drawn over it and sutured. In this way the pedicle is completely hidden. (b) Krentzmann‡ brings the tumour out, and then dissects a collar from the pedicle down to the point of section. He divides the pedicle, picking up vessels one by one, and removes the tumour, then ties the vessels and sutures the collar of peritoneum over the end of the stump. (c) Rosen§ seizes the pedicle with one or two pairs of forceps and cuts above them; he ties the larger vessels, removes the forceps and ligatures any bleeding points. He draws the peritoneal sheath over the pedicle and ligatures it. The pedicle is thus provided with a peritoneal sheath. (d) A fourth method consists in ligaturing the pedicle as usual. A suture is then passed immediately below this primary ligature and tied, so that its two ends are in front. With a Deschamps needle the two ends are separately drawn through the broad ligament and tied on the front of this. The pedicle is thus pulled into, and adheres to, the posterior surface of the broad ligament.

Bisection of the Uterus in Hystero-salpingo-oöphorectomy.

The principle of bisection of the uterus, both in the removal of adnexa in which there have been suppurative conditions leading to extensive adhesions, at one or both sides, and in tumours complicated by adnexal abscesses and adhesions, has been accepted for a considerable time. I saw the Landaus adopting it in Berlin in 1897, Doyen in Paris the year after, and Schauta in Vienna in 1899. This was in *vaginal* operations for adnexal, cancerous, and other tumours, also in some myomata.

Faure (Paris) first adopted the same principle in *abdominal* coeliotomy for pelvic suppurations, and carcinoma of the uterus and adnexa. He carried the bisection from above downwards, through both the anterior and posterior surfaces of the uterus, first securing the uterine arteries by carrying the section outwards towards the broad ligament. The principle was also followed in the removal of certain myomata, both uterine and intra-ligamentary, which were firmly held down in the pelvic cavity by adhesion, and in intra-ligamentary growths of the broad ligaments, as well as in those in

* International Congress, 1899. † *Revue Méd.*, 1893.

‡ *Amer. Jour. Obstet.*, 1896.

§ *Przegląd Lekarski, Krakovia*, 1900.

which the myoma lies under the vesical peritoneal reflection, and more especially in such cases in which diseased states of the adnexa complicate the tumour.

However, quite independently of Faure, Howard Kelly* practised the same abdominal method in certain complicated cases of myoma, and also in the removal of adnexal masses consequent upon extensive inflammatory and suppurative states. He pursued the same plan in cases of cervical myomata which pushed the bladder up out of the pelvis with the utero-vesical peritoneum; clamping the uterine and ovarian vessels at either side, he divided the uterus from above down, removing either half, closing the bed of the tumour by buried sutures, and covering the wound by uniting the vesical and the posterior peritoneum with sutures. He urges this method in the case of fibroid tumours of large size filling the pelvis and raising with its growth the uterine and ovarian vessels, in consequence of which displacement these vessels cannot be tied *en masse*. Should the colon or rectum be intimately attached to the tumour, he advocates the plan of leaving a very thin layer of the tumour upon the bowel rather than endanger the latter by removing it.† He takes the following condition as an indication of a modification of this method: 'Given a uterus with dense lateral inflammation binding down the adnexa beyond the possibility of liberation by fingers alone, and added to this adhesions of the bowel and of the bladder, almost or quite burying the uterus,' and he proceeds thus:—

The neck of the uterus having been grasped by a curved vulsellum, introduced through the vagina, and the pelvis having been elevated, the abdomen is opened freely in the middle line. By the vulsellum in the vagina the cervix is pushed as high as possible in the direction of the incision until it projects behind the symphysis. The bladder is now freed and pushed down. The supra-vaginal cervix is next grasped between the two vulsellum forceps, and divided transversely. By drawing the upper portion of the now divided neck well up with Museau forceps, the uterine arteries are exposed and clamped. Forceps are next applied on either side of the severed cervix, and the uterus is divided from below upwards with careful regard to the rectum, and any adhesions, 'if need be, leaving small areas of uterine tissue adherent to

* *Amer. Jour. Obstet.*, Aug., 1900; *Johns Hopkins Hospital Bulletin*, 1900, p. 56, xi.

† See *Johns Hopkins Bulletin*, March, 1900, Jan., 1901.

the bowel.' Each half of the uterus is then removed, after which the ovarian vessels are ligatured, and there is ample room to free and remove the adherent adnexa.*

Vaginal Myomectomy.—This operation by enucleation is more specially adapted for submucous fibroids which protrude in the direction of the cavity of the uterus, being embedded in the muscular stroma. Enucleation is by many considered justifiable under these circumstances, even when the tumour has attained to the size of the head of the foetus at full term.

The step of *morcellement* has been added to that of enucleation, to facilitate further the removal of the mass in cases in which it is not possible to shell it out and deliver it in its entirety. Obviously, the character of the operation must vary according to the size and depth of the tumour. The patient is thoroughly prepared as for vaginal hysterectomy. It is necessary to have at least three assistants. One pushes the uterus well down; one at either side of the operator takes charge of the retractors, the douche, or the vaginal douche retractor; and both mutually assist in the manipulation of the uterus in securing hæmostasis and ligaturing.

The steps of the vaginal operation consist of (a) preliminary incision as far as the vaginal attachment, having first ligatured the lower branches of the uterine vessels. (See Ligation of the Uterine Arteries, p. 256).

(b) The second step consists in the complete depression of the tumour by strong fixing forceps, and the opening of the capsule. This is done with scissors, bistoury, or the nail of the operator. (c) The third step consists in the separation of the tumour with

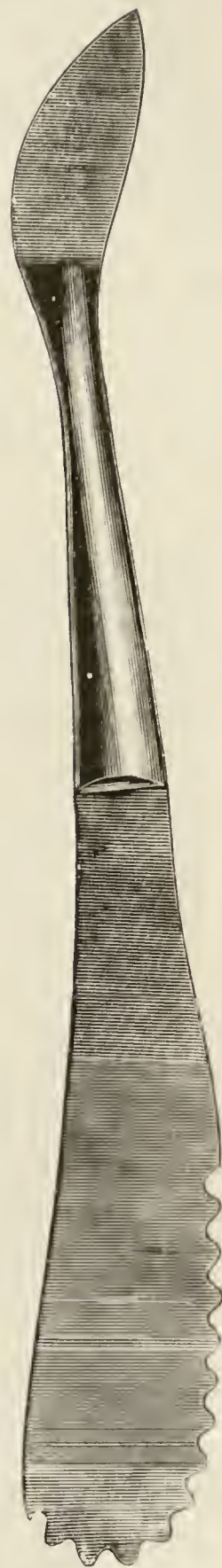


FIG. 304.—ENUCLEATOR FOR SHELLING OUT THE TUMOUR.

The serrated end is the latest suggestion of Kelly.

* See Figs. 256, 256A, pp. 368, 369.

the finger, spatula, or the enucleator of Kelly, assisted possibly by the scissors. After this (*d*) the tumour is extracted, as is done in the case of a polypus. The gaping wound is trimmed of any torn portions of mucous membrane which remain, and is thoroughly irrigated with hot water. Search is now made for any small myomata, which must be in turn enucleated by aid of the scissors or enucleator. Finally, the cavity is tamponed with sterilized iodoform gauze, and a subcutaneous injection of ergotine is given to promote uterine contraction.

The immediate dangers of the operation are hæmorrhage, perforation of the uterine wall, and possible inversion of the uterus during traction; the more remote are embolism, thrombosis, peritonitis, and septicæmia. All these dangers are now diminished in view of a scrupulous aseptic technique. It may be necessary to divide the vaginal wall posteriorly, as well as the uterus, and occasionally also the anterior cul-de-sac. Where the division of the cervix runs up to the fundus, the peritoneal cavity has, in some cases, to be opened. Should this happen, it is better not to close it with sutures, but let the edges fall together. There is less chance of after trouble. At the same time it is always best to avoid injuring the peritoneum if possible, and to push it up cautiously both anteriorly and posteriorly should it be necessary to carry the incision through both walls of the uterus.

Enucleation by Cœliotomy of Large Interstitial Myomata.—Spencer Wells was one of the first operators who performed this operation. Subsequently A. Martin, Spiegelberg, and others largely practised it.

If the operation of complete enucleation in the case of a large tumour be performed by cœliotomy, a temporary elastic ligature or the rope of Tait is carried round the body of the uterus, below the growth, which is then opened through its capsule. A V-shaped or circular incision is made over the most prominent portion of the tumour, which is then enucleated. The peritoneal flaps are trimmed for accurate adaptation, buried sutures are placed from below upwards, approximating the uterine tissues, and, finally, the peritoneal surfaces are united by interrupted sutures. If the uterine cavity be opened, the mucous membrane is sutured separately. Drainage is maintained by the vagina (Martin), or by the abdominal wound (Hegar).

William Alexander does not hesitate to remove large myomata by the vagina, opening up the anterior and posterior peritoneal folds. He also

strongly advocates enucleation by abdominal cœliotomy. His method consists of—

1. The enucleation of all the tumours through one longitudinal opening in the fundus uteri.

2. Packing the cavities whence the tumours have been removed with aseptic or antiseptic gauze, and stitching up the wound in the uterus with catgut sutures, leaving the end of one long strip of gauze to emerge from the lower end of the uterine wound, and to reach the surface of the abdomen through the lower angle of the cœliotomy wound.

3. Fixing the uterus temporarily to the abdominal wall by a single silkworm-gut suture tied on the surface of the abdomen.

In all cases we must endeavour to avoid opening the uterine cavity.

Hæmorrhage is prevented and drainage is secured by the gauze, and oozing from the uterine wound is arrested by the pressure of the uterus against the parietal peritoneum.

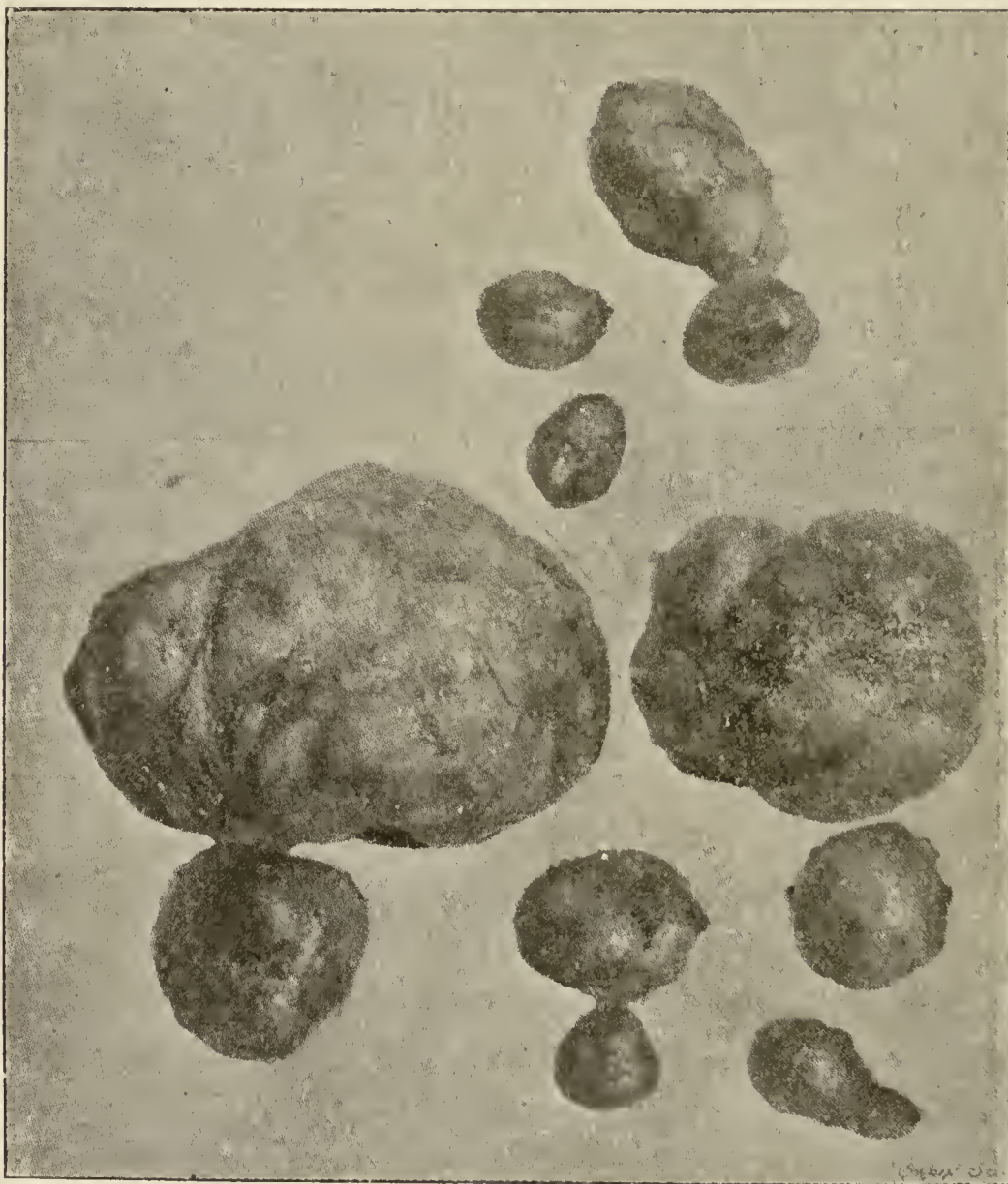


FIG. 305.—FIBROMYOMATA SUCCESSFULLY ENUCLEATED FROM A PATIENT BY ALEXANDER'S ABDOMINAL CŒLIOTOMY.

The packing is removed at the end of forty-eight hours, and the silkworm-gut suture at the end of fourteen days.

Should the uterine cavity be opened, it must be drained by a glass tube from below.

Indications for Myomectomy.—Howard Kelly says that myomectomy should always be preferred to supra-vaginal or pan-hysterectomy in a young woman, when no complications exist to interfere with the operation, and where the uterus is not larger than a six months' pregnancy. He thus categorically classifies the cases suitable for abdominal myomectomy: (1) Pediculated myomata, after the removal of which we can preserve a normal uterus. (2) All interstitial or subserous myomata which are well defined in relation to the body of the uterus, whether single or multiple. (3) Multiple small myomata. (4) Broad ligament myomata. (5) A myoma localized at one cornu of the uterus. (6) A submucous myoma too large to be taken out by the vagina.

To this we may add that in a case of myoma complicating pregnancy, when surgical interference is called for, myomectomy is the operation of election.

Indications.

The decision as to the suitability of the tumour for myomectomy will depend on the care with which the following points are determined beforehand: (1) The presence of a well-defined pedicle. (2) The definition of well-defined tumours of various sizes in the uterine wall. (3) The recognition of an intra-mural fibroid in the anterior or posterior wall of the uterus, while the uterus itself is not much enlarged, as determined by the uterine sound. (4) The determination of the absence of serious pelvic complications (Kelly).

Ligation of the uterine arteries may be called for, and clamps and the temporary rope or elastic ligature should be at hand. Some surgeons prefer to operate in sterilized gloves, especially in the case of large interstitial myomata.

It is thus possible to remove a number of myomata. Chromicized cumol ligatures are employed for closing the cavities. Kelly does not use a drainage tube, and he lays particular stress on the necessity for arrest of the hæmorrhage by interrupted or mattress sutures applied from the bottom of the wound to the peritoneal surface of the areas most affected.

Loubet of Paris* is a warm advocate for enucleation of myomata, arguing that the mortality appears as low as 2.94 per cent. He secures vaginal

* *Revue de Gyn.*, 1902, t. vi., No. 2.

drainage by dilatation with laminaria tents the day before the operation, and an incision in the median line. He resorts to abdominal drainage for forty-eight hours after the enucleation, whereas the vaginal drain is kept up for five days. Multiple myoma, he considers, contra-indicate enucleation.

Morcellation.—The patient having been placed in a suitable position, the same steps are taken as in the operation for enucleation.

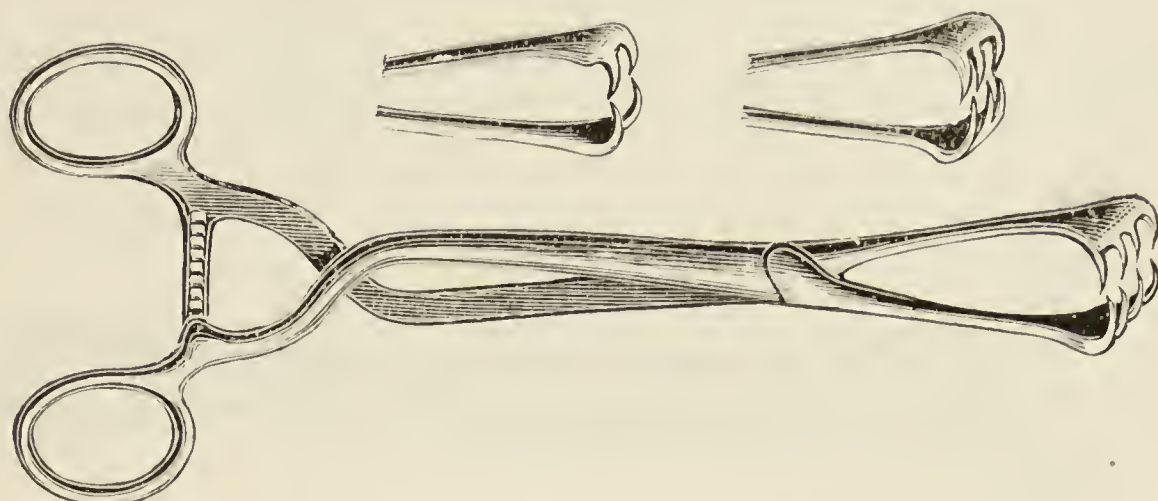


FIG. 306.—FORCEPS FOR GRASPING THE TUMOUR IN MORCELLATION.

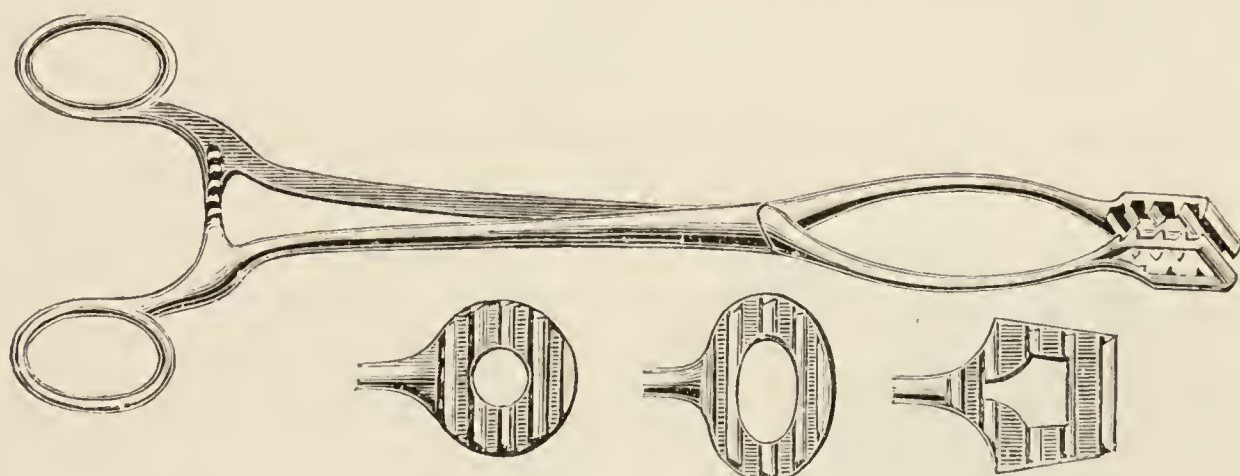


FIG. 307.—MORCELLATION FORCEPS.

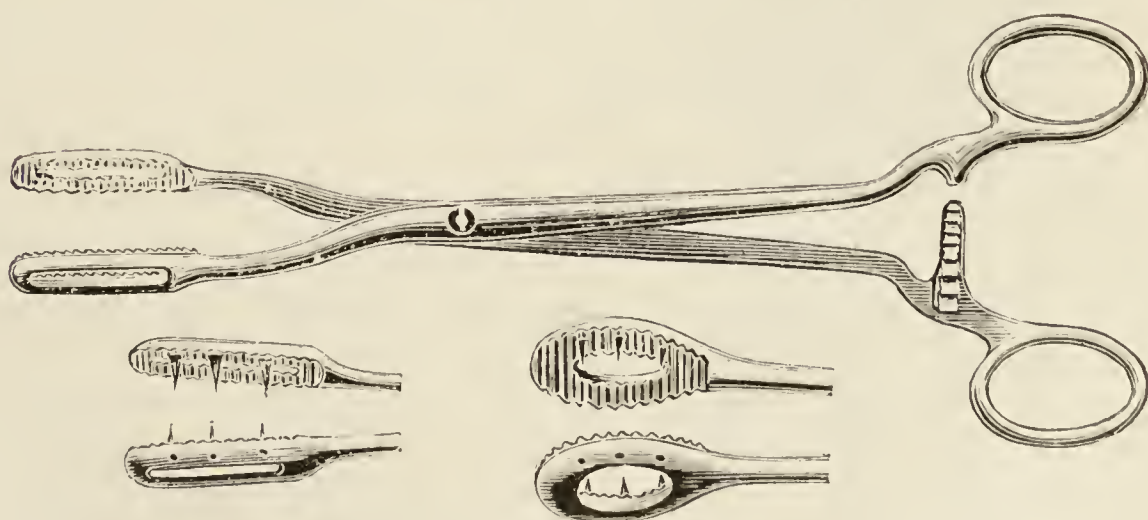


FIG. 308.—PÉAN'S CYST FORCEPS, USED IN MORCELLATION.

The uterine neck is seized with a strong vulsellum forceps, and drawn down. A circular incision is carried round the vaginal attachment, and the bleeding points are secured by pressure forceps.

The uterine neck is then freed, the peritoneum, bladder, and ureters being carefully avoided. When the tumour to be removed is of



FIG. 309.—DOYEN'S TUBE TRANCHANT.

considerable size, the next step should be the ligation of the uterine arteries. The cervix is next divided by scissors into two halves

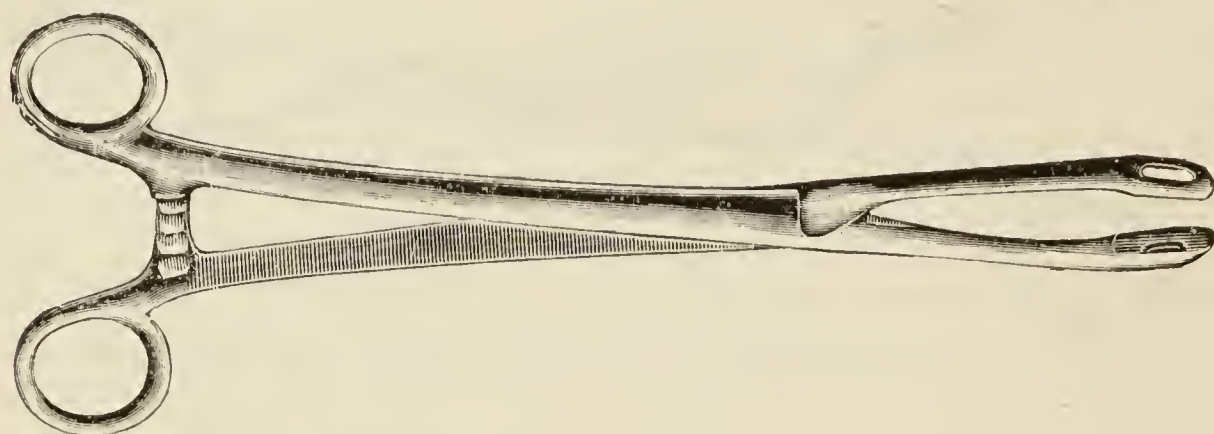


FIG. 310.—FORCEPS USED WITH THE TUBE TRANCHANT.

by incisions reaching to the fibroid tumour, and each half is held

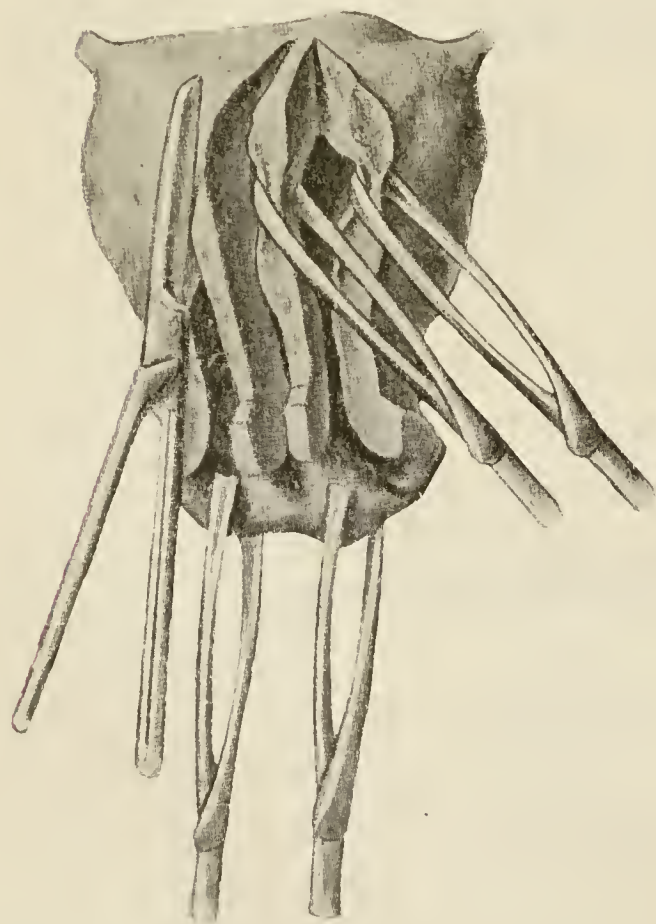


FIG. 311.—MORCELLATION OF ANTERIOR WALL OF UTERUS IN STRIPS. (LANDAU.)

aside by a strong-toothed fixing forceps, or a V-shaped flap is made and the tumour is thus exposed. It is then as far as possible examined by the finger, the uterus being drawn well down for the purpose. The vaginal walls are held widely apart by retractors, and smaller ones are introduced inside the uterus, and with such forceps as those shown (Figs. 306–308), the tumour is grasped, and a deep longitudinal incision is made into it. Then portion after portion is seized with somewhat similar forceps, and a curved scissors being carried under it, the piece thus caught by it is excised. Two or more

forceps are used, and a second portion of the growth is caught

before that first seized is removed. The bistoury has a short, broad, and strong blade.

Some tumours bleed more readily than others, rendering the successive removal of each portion more difficult than in the case of bloodless fibroids.

Should other small myomata be found in the neighbourhood of the larger mass, these and other fibromatous nuclei should be removed by enucleation or morcellation. Hæmostatic forceps are freely availed of in cases where there is much bleeding. The operator has a large number of gauze tampons on holders ready to hand, to staunch the blood and enable him to see the bleeding points. All clots are removed. Forcipressure and sponging are assisted by hot irrigation. In some cases, where the mass removed is very large and the bleeding difficult to restrain, forceps are allowed to remain on from thirty-six to forty-eight hours after the operation, tampons of iodoform gauze being packed in between. Otherwise it is sufficient to suture the wounds in the uterine neck.

Morcellation of a large fibroma may also be practised by Doyen's method, thus: A large V-shaped mass, the base of the V reaching to a short distance beneath the broad ligaments, or level with these, is seized in a strong claw-forceps by its apex, and held firmly while successive lozenge-shaped masses are seized with the forceps, and cut away until the entire triangular mass is removed. In this manner the bulk of the tumour is so reduced that, when it is seized

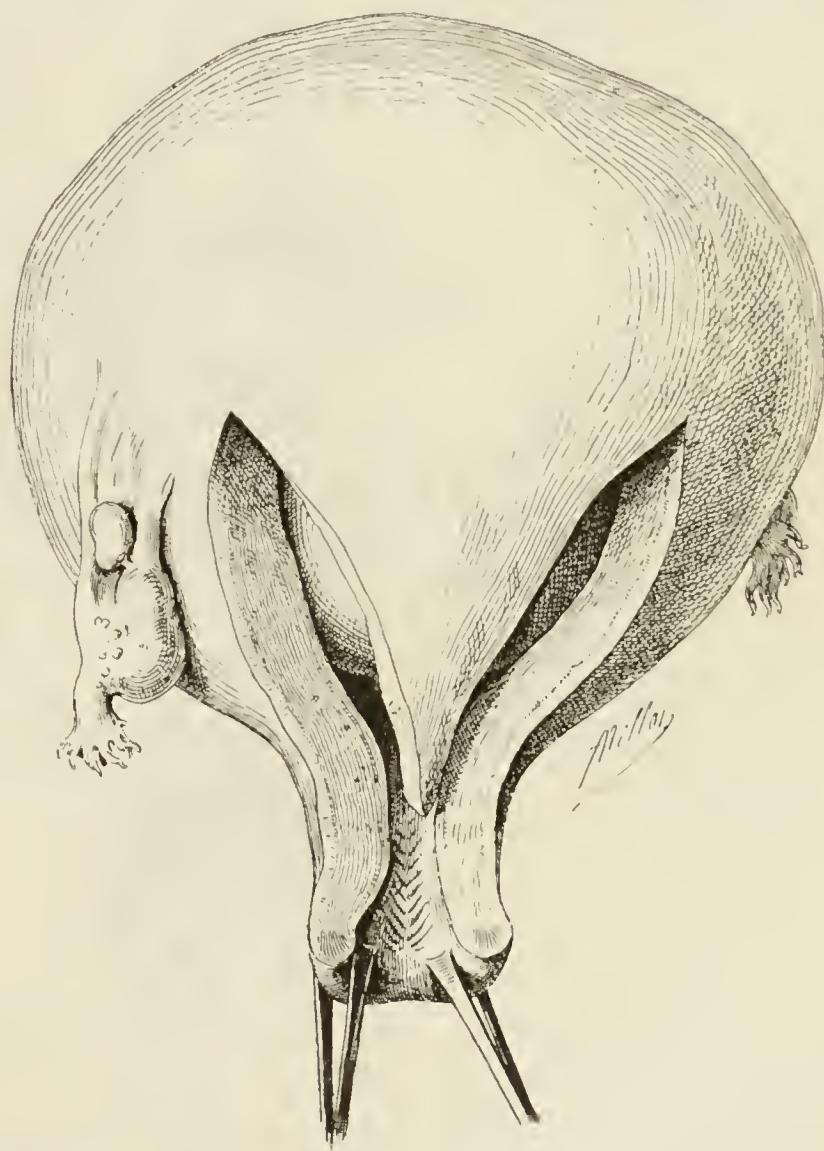


FIG. 312.—MORCELLATION FOR SUBMUCOUS FIBROMA
—V-SHAPED FLAP RAISED ON ANTERIOR WALL.
(DOYEN.)

transversely, it can be drawn down to the vulva. Introduction of the finger may be feasible between the tumour and the uterine covering, and it may be in this manner detached from its cellular bed.

Submucous Fibromata.

In the case of large intra-uterine submucous fibromata, and also in certain interstitial ones, morcellation is practised thus: The uterus is incised along its anterior wall with a V-shaped incision, and the flap thus formed is raised over the tumour, the lower part

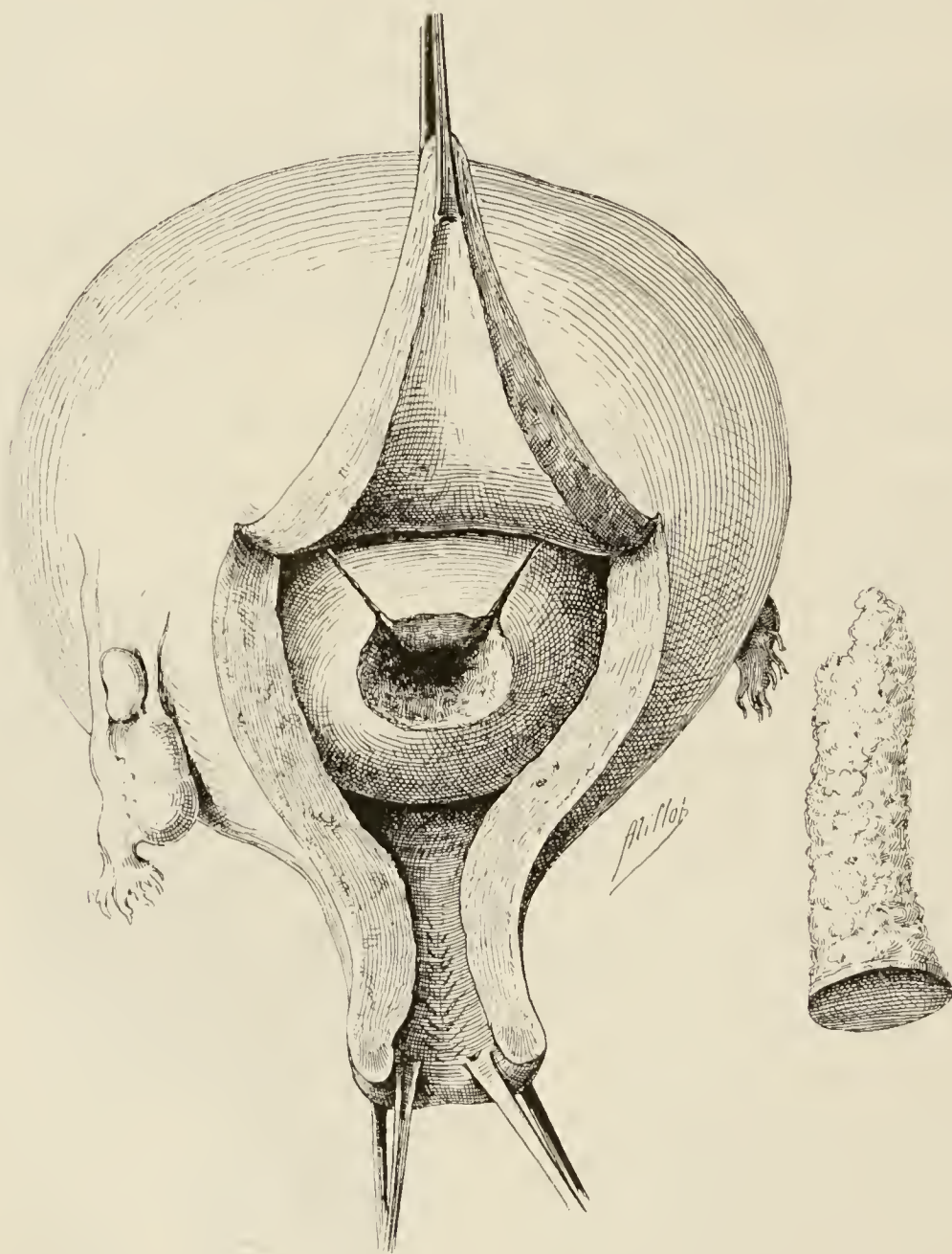


FIG. 313.—V-SHAPED FLAP RAISED, AND THE PORTION REMOVED BY THE DRILL SHOWN.

of which is thus exposed; or the section is made in the form of a Y, the stem reaching to the os uteri, and the two branches extending laterally in the direction of the broad ligaments. The *tube tranchant* of Doyen (Fig. 309) is here of special use, as it drills

a large tunnel through the substance of the tumour ; or, again, the wall of the tumour is incised in lozenge-shaped pieces, and these are removed portion by portion from the hollowed-out space bored by the sharp drill, the now friable fibroma being extracted in fragments by forceps. The more friable the tumours are the more readily are they removed. The nature of the morcellation, and the technique of the operation, must depend upon the size of the fibroma and its consistence. The primary step in these cases is always careful separation of the bladder and detachment of the peritoneum, with the ligature, whenever necessary, of the uterine vessels. When the fibroma has been enucleated, the incision on the anterior wall is closed with catgut suture, and the cavity is tamponed temporarily with sterilized iodoform gauze, or ordinary sterilized gauze wet with formalin solution. This tampon is removed on the second day, and intra-uterine and vaginal douches are given. The douches are repeated frequently, five or six times in the twenty-four hours, and the temperature is carefully watched.

Myomectomy for a Pediculated Myoma, the Uterine Cavity not being opened.—A temporary elastic ligature or the rope of Tait is placed as low as possible on the uterus. When the tumour is delivered, the treatment of the pedicle will depend upon its size,—when small by ligature ; but if of a larger size and thick, it is compressed by a powerful clamp-forceps, and the tumour is cut at a sufficient distance

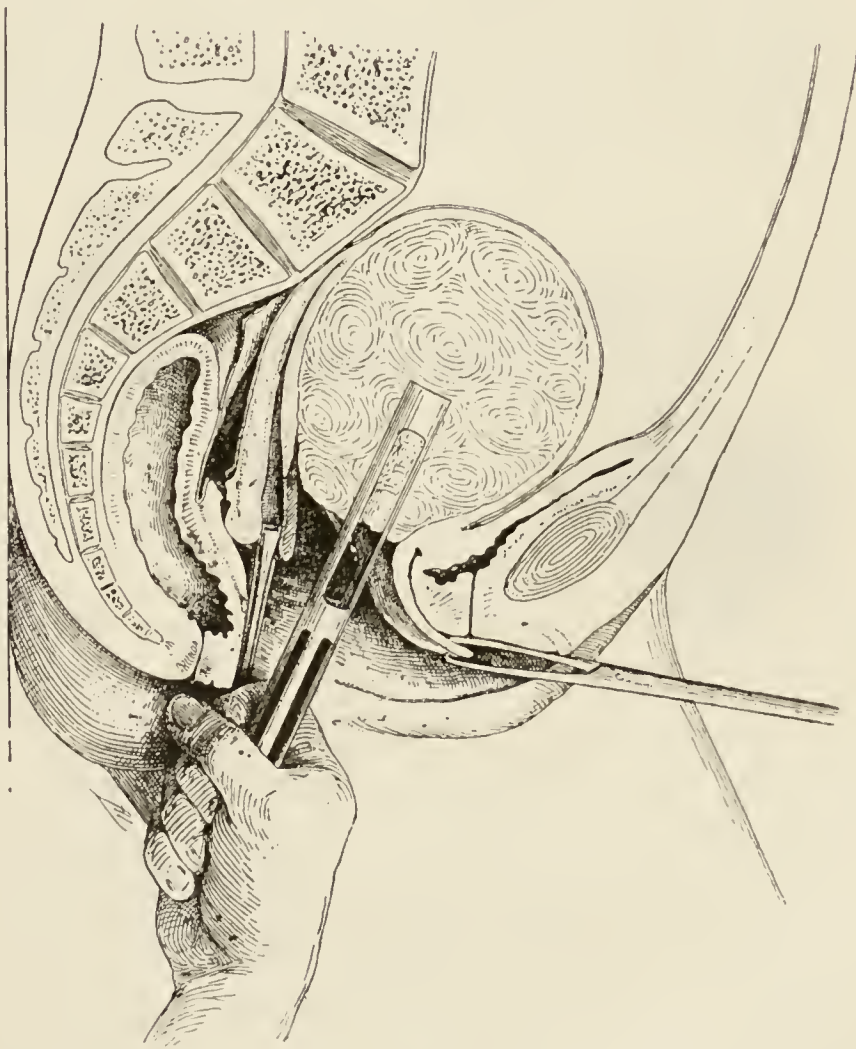


FIG. 314.—APPLICATION OF THE 'TUBE TRANCHANT' OR DRILL OF DOYEN TO THE 'TUMOUR.

so as to peel off the peritoneum and fashion the stump, which is carefully covered by it. This is done with gut suture. When all

bleeding is stayed by means of forceps or ligature of the separate points, the pedicle is returned into the abdomen.

Fibromata of the Broad Ligaments—Decortication.—The tumour may protrude by a comparatively small pedicle into the peritoneal cavity, or, on the contrary, its base of attachment may be thick, and the greater portion of the tumour be in the true pelvis. In the former case it may be possible to remove it, as in the operation of myomectomy. Should this not be so, the adnexa on the side corresponding to the tumour have to be drawn well forward, and the broad ligament is divided between two T-shaped clamp-forceps, the greatest care being taken to avoid wounding the bladder, which is often found in close contiguity. A circular incision is made if the tumour be large, or a longitudinal one will be sufficient should it be of a comparatively small size. The margins of the incision having been seized with clamp-forceps, the tumour is drawn forwards by a strong claw-forceps, and its covering peeled off gradually with the fingers, bleeding being controlled in the usual manner during this step. The pedicle is secured by strong compression forceps or the angiotribe of Zweifel. It is then removed,

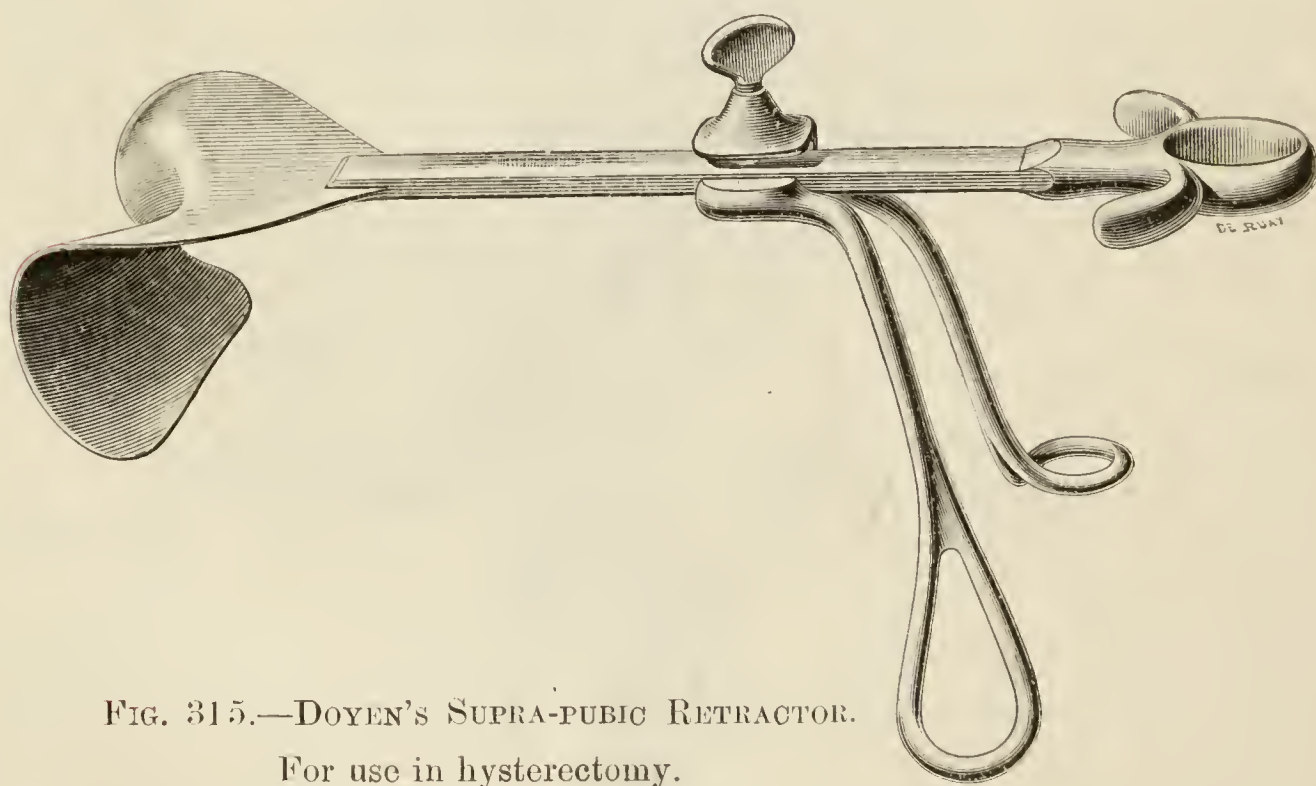


FIG. 315.—DOYEN'S SUPRA-PUBIC RETRACTOR.

For use in hysterectomy.

and, the bleeding ends of any vessels having been secured by gut ligatures, the peritoneum is carefully peeled back, the stump is fashioned and then covered with the peritoneal flaps by sutures. In all such cases both operator and patient must be prepared for hysterectomy.

CHAPTER XXVI.

UTERINE NEOPLASMS—MYOMA (continued)— SURGICAL TREATMENT.

Abdominal Pan-Hysterectomy.

By Ligature.

Appliances Required for Operation.—In the chapter on Asepsis and Antisepsis I have already referred to all the preliminary steps in the preparation of the room, the nurses, the assistants, the patient, and the appliances necessary for a laparotomy operation. In abdominal hysterectomy it is well to have all the following instruments sterilized and ready to hand:—

A few scalpels and a blunt-pointed bistoury.

A number of hæmostatic forceps—Péan's, Wells', Zweifel's and Doyen's.

Some Kocher's clamp forceps.

Two of Bilioth's clamp forceps.

Variously curved sharp-pointed and blunt scissors.

Doyen's helicoid.

Tenacula, single and double.

Clamps, various sizes—slender, strong, and curved, and an ovarian ring clamp.

Four light clamp forceps, as sponge and dab-holders.

Retractors—glass (author's) or other.

Broad ligament needles of various sizes (Deschamps').

Needle-holders (preferably Olshausen's, Schauta's, and Doyen's peritoneal).

Tait's rope écraseur.

Paquelin's or the electric cautery.

A trocar and cannula.

Steps of the Operation—Preliminary Incision—Exposure of Tumour.—Up to a certain stage the steps are all the same in every intra-peritoneal operation. The incision varies in length according

to the size of the tumour to be removed. It may have to be prolonged upwards by scissors or bistoury. The surgeon keeps in the middle line, avoiding the rectus sheath. Should he open it, he completes the incision by cutting directly through the muscle. Some surgeons prefer to open the abdomen through the rectus muscle, as the author does frequently. It is thought by some that by so doing the risks of hernia are lessened. The cleaner the abdominal wound the better. Bruising the tissues and laceration of the muscle fibres are to be avoided.

Hæmostatic forceps are applied to the bleeding points, and all hæmorrhage quickly arrested by forci-pressure, or, should this fail,



FIG. 316.—WELLS' HÆMOSTATIC AND TORSION FORCEPS.

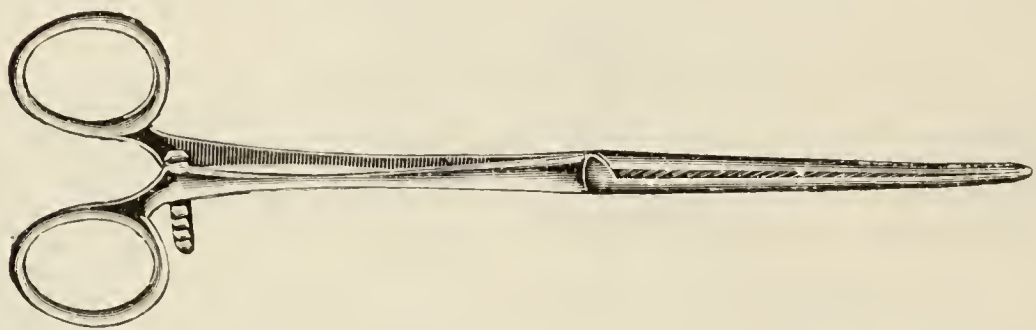


FIG. 317.—SLENDER CLAMP, WHICH CAN BE USED ALSO AS SPONGE AND GAUZE-DAB HOLDER.

($\frac{1}{3}$ size.)

by fine gut ligature. It is not wise to make the first incision longer than five inches, or to approach too closely to the symphysis.

Extreme Obesity.—A fat abdominal wall requires a correspondingly long incision, otherwise it will be found very difficult to see the parts, to deliver a tumour, or to manipulate within the abdomen.

Superficial Adhesions.—After the preliminary incision, and when the tumour is exposed, should adhesions be detected by the fingers or hand, the incision must be extended with strong angular scissors or scalpel, care being taken in cutting towards the bladder, which in some tumours or cysts lies rather high. The peritoneal opening should always be of the same size as the external wound.

The peritoneum is opened by holding it well up with two catch forceps, and dividing it with a scalpel horizontally between the two.

It is next incised to the necessary extent with a straight blunt-pointed bistoury.

The position of the fundus of the bladder is determined by the introduction of a sound. Catch forceps are then applied to the peritoneal margin on either side, both being thus readily held apart.

The tumour is next examined by the hand introduced into the wound, and its extent and surroundings are carefully determined. Its depth in the pelvic cavity, the form of its pedicle, and the extent of the adhesions (if any) are ascertained.

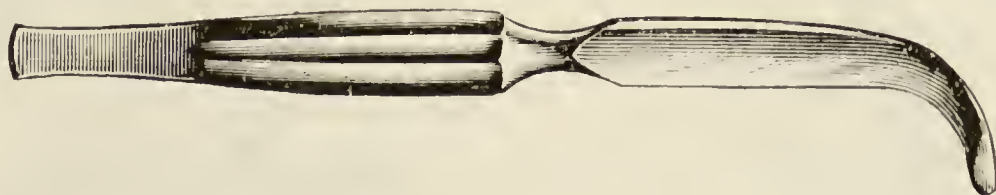


FIG. 318.—PERITONEAL KNIFE OF COOK (VIRGINIA), WITH FLAT BLADE ENDING IN SHARP BLUNT-POINTED BEAK.

Useful in cases of peritoneal adhesions to the bowel and other viscera.

Here, if it be thought necessary, the length of the abdominal opening is increased ; this may be done either with the scalpel or with strong blunt-pointed scissors (Fig. 347). It may have to be prolonged by the side of the umbilicus as far as the xiphoid appendix. Care must be taken, in cases where there have been previous attacks of general peritonitis, lest the bowel be so adherent to the peritoneum that it runs the risk of being opened when the latter is incised.

The Transverse Kuestner-Rapin Incision.

Pfannenstiel* and Menge† have recently written advocating in certain cases the Kuestner-Rapin incision, which is carried through the aponeurosis of the abdominal muscles whenever possible inside the limit of the pubic hair. This latter incision Menge prefers when the operative procedure is mainly in the pelvis. Pfannenstiel prefers the usual higher transverse one. The incision through the recti is made vertically. The aponeurosis and the subcutaneous fat are separately stitched. At the same time, in the case of the larger tumours, the vertical incision is still adopted by both operators. Menge, however, resorts to the transverse one even in some of these latter. The principal advantages of the transverse incision are said to be the better cosmetic effect, and the avoidance of hernia.

The next step is the separation of the parietal adhesions, if they be present ; this may be done with the finger.

Small bleeding points are treated by pressure, and any bleeding vessel of a separated adhesion is secured by a fine gut ligature.

* *Samml. kl. Vortraege, nf.*, No. 268. † *Monats. f. Geb. und Gyn.*, bd. 17, s. 1259.

Should the day be dark and the light defective, the lamp (Fig. 85) will suffice. Its reflector can be turned at any angle and retains its position. Or the forehead reflector can be availed of. The bowel is now carefully protected by means of small moist sterilized protectors wrung out of weak formalin solution, and nipped at one corner with a pressure forceps.

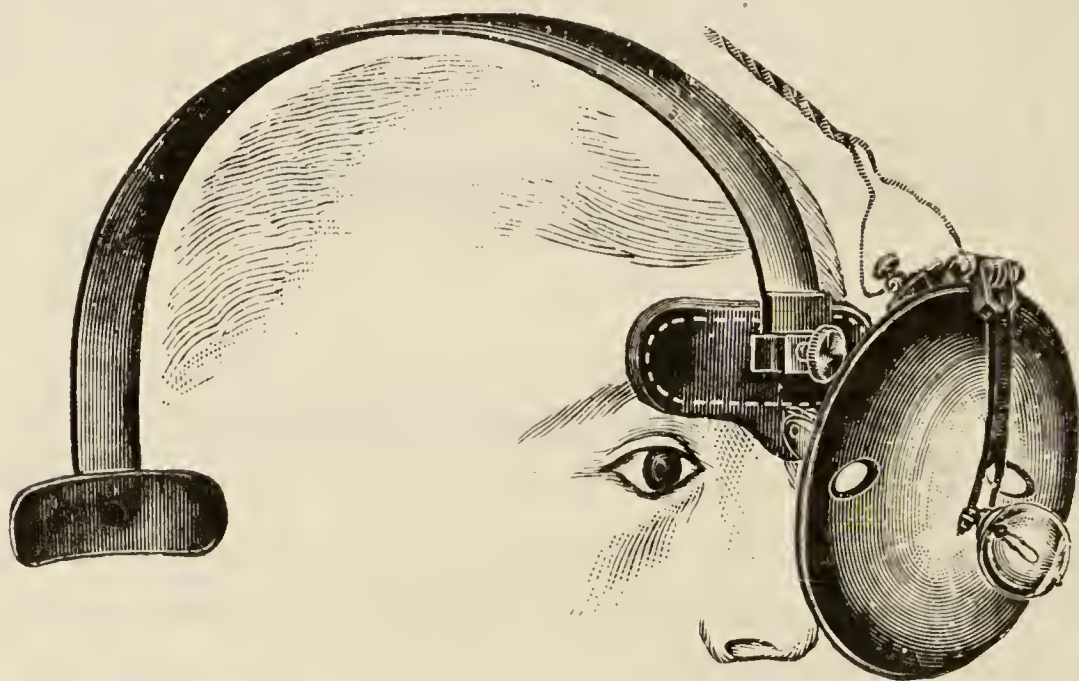


FIG. 319.—FOREHEAD REFLECTOR.

Retractors are useful for drawing the abdominal wall at either side of the incision apart, and the glass ones of the author are convenient for this purpose (Fig. 320). The extreme Trendelenburg

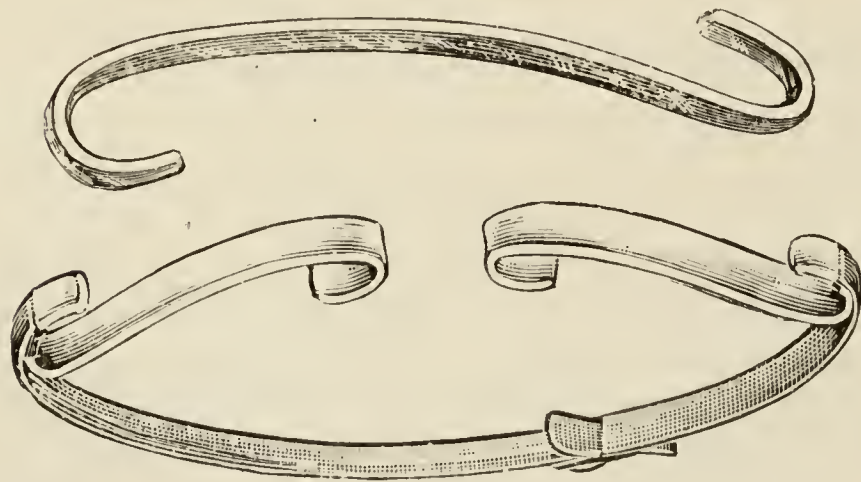


FIG. 320.—GLASS RETRACTORS OF AUTHOR
(self-retaining if required).

position may be necessary in some cases to expose the pelvis thoroughly, in the management of adhesions and the control of bleeding points.

The delivery of the myoma is frequently difficult, and has to be conducted with the

greatest care. Adhesions may be torn through by roughness, and the viscera thus injured. It is also of importance to avoid bruising the parietes, thus injuring their vitality. The delivery of the tumour may be assisted by its elevation by means of pressure made through the vagina by an assistant. The corkscrew of Tait,

the helicoid of Doyen (Fig. 340), or the elevator of Reverdin, are of use in the delivery of large myomata. If we find that we

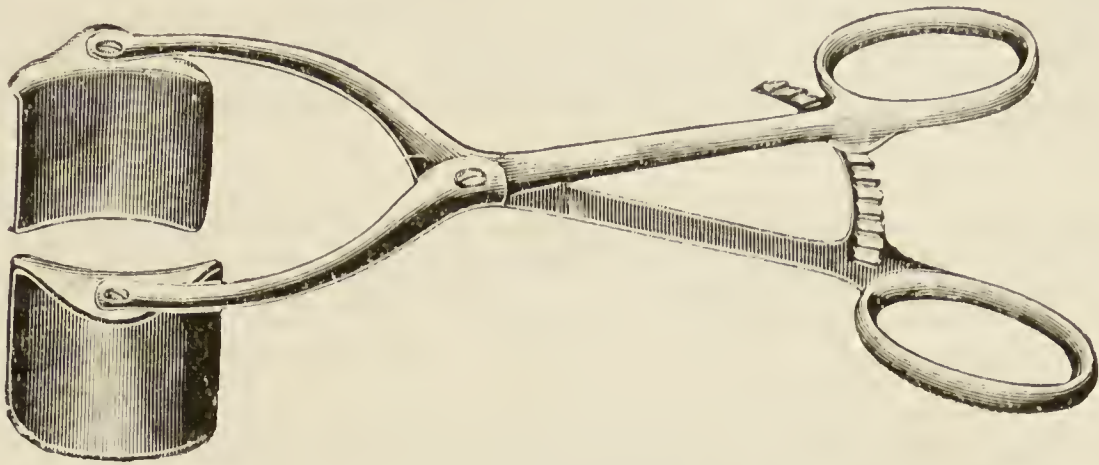


FIG. 321.—SEGOND'S BIVALVE SELF-RETAINING ABDOMINAL RETRACTOR.
The blades are movable.



FIG. 322.—DELIVERY OF A FIBROMYOMA WITH THE HELICOID OF DOYEN.
(DOYEN.)
From a photograph.

cannot deliver the myoma in consequence of its depth in the pelvis, or the associated myomatous growths between the layers of the broad ligament, we must proceed to divide and ligature the latter; or temporary compression of the ligament between clamps is made, allowing of its section at either side, so as to permit of the delivery of the tumour.

The Presence of Pus.—The presence of free pus in the pelvic cavity, if detected when the patient is in the Trendelenburg position, will necessitate immediate lowering of the table, and careful exclusion of the exposed surface of the bowel with gauze and flat sponges. In these cases especial care must be taken when the pelvis and abdomen are freed of the tumour to cleanse the cavity with formalin dabs, or to flush it out with sterilized saline solution. I prefer the formalin method.

Bowel, Rectal, and Bladder Adhesions.—In detaching these, great care must be exercised. The best plan is to work towards the uterus, and away from either viscus, with the finger nail, and with a small sponge or roll of gauze we complete the detachment as far as we prudently can. We again resort to the finger nail or blunt-pointed curved scissors, and repeat the peeling process with the sponge. Should it be either impossible or rash to proceed with the separation of bowel or vesical adhesions, it is better to separate with the scissors a thin layer of the tumour tissue, which may be left attached.

Position of the Adnexa.

It is important to bear in mind the relative position of the adnexa to certain tumours. Doyen has shown these several relations of the adnexa to various tumours in a series of schemes drawn from the conditions he found in his operations. In some the difficulty of securing permanent hæmostasis was necessarily great. This relation is dependent upon the mode of growth and the original point of development of the tumour. It will also be influenced

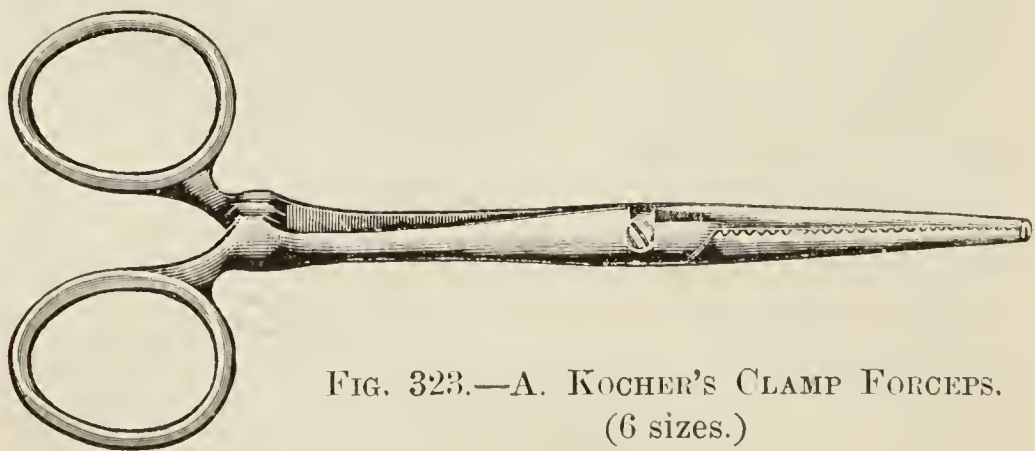


FIG. 323.—A. KOCHER'S CLAMP FORCEPS.
(6 sizes.)

by the shape and multiple nature of the fibroma. If, for example, the tumour should distend and fill the uterus, being of the submucous character, it will push the adnexa upwards towards the upper zone of the tumour. A sessile subperitoneal tumour, springing from the fundus of the tumour, will have the adnexa directly beneath its base, whereas, if it be pediculated, they will be found in their usual position; a large multiple fibroid springing from the fundus,

and depressing the uterine cavity, has them lying underneath its base and attached to it. A tumour developed in the posterior wall, and encroaching on the space of Douglas, will push the ovaries and tubes aside; the adnexa may thus be found either on the summit, or spread out on the side of the tumour. So if it be developed in the lateral wall or in the broad ligament, the pelvic peritoneum and ovary will cover it. Associated perimetritic conditions, such as salpingo-ovaritis, will cause adhesion and attachment of the adnexa.

When the tumour has been withdrawn from the abdominal cavity it is supported by an assistant, and its pedicle is temporarily secured by a strong clamp forceps. The intestines are protected, and all



FIG. 324.—LIGATURE HOOK. (SANITER.)

The hook is turned at such an angle as to require only half a rotation of the handle to vigorously catch the loop of the ligature.

bleeding points are secured. This protection of the peritoneum and intestine after the delivery of the tumour is a matter of the greatest moment in a prolonged operation. Both extrusion and

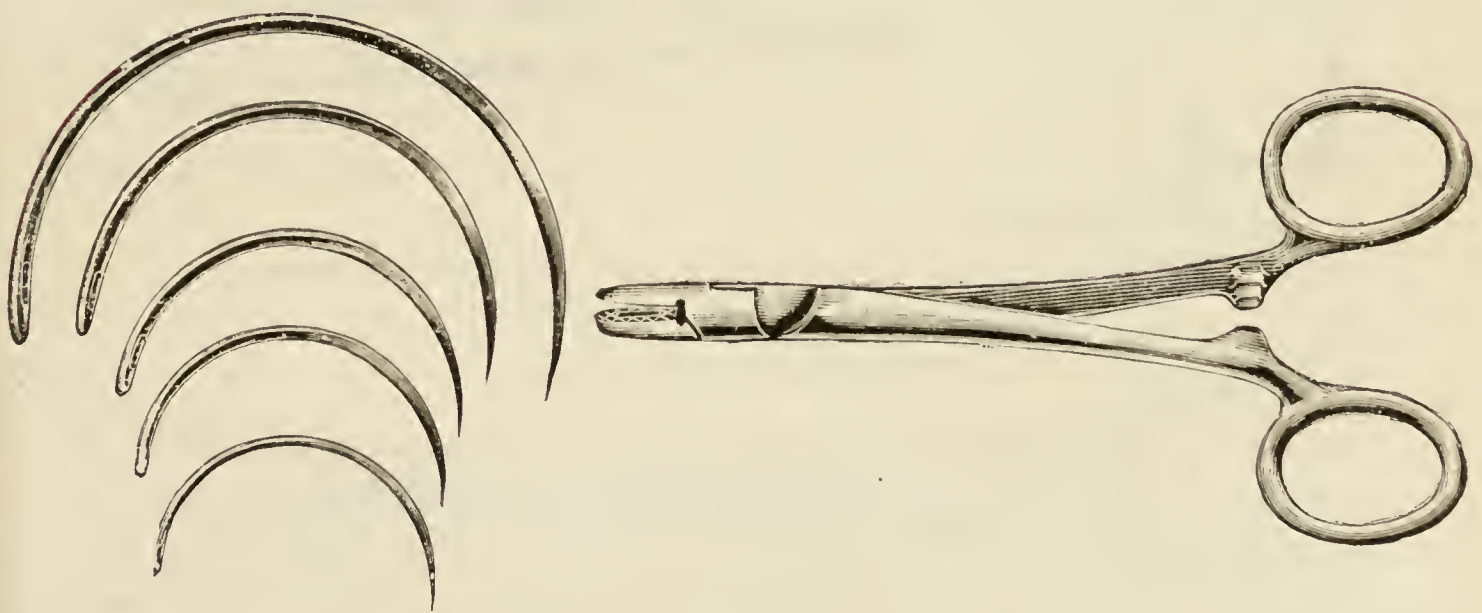


FIG. 325.—CURVED NEEDLES.

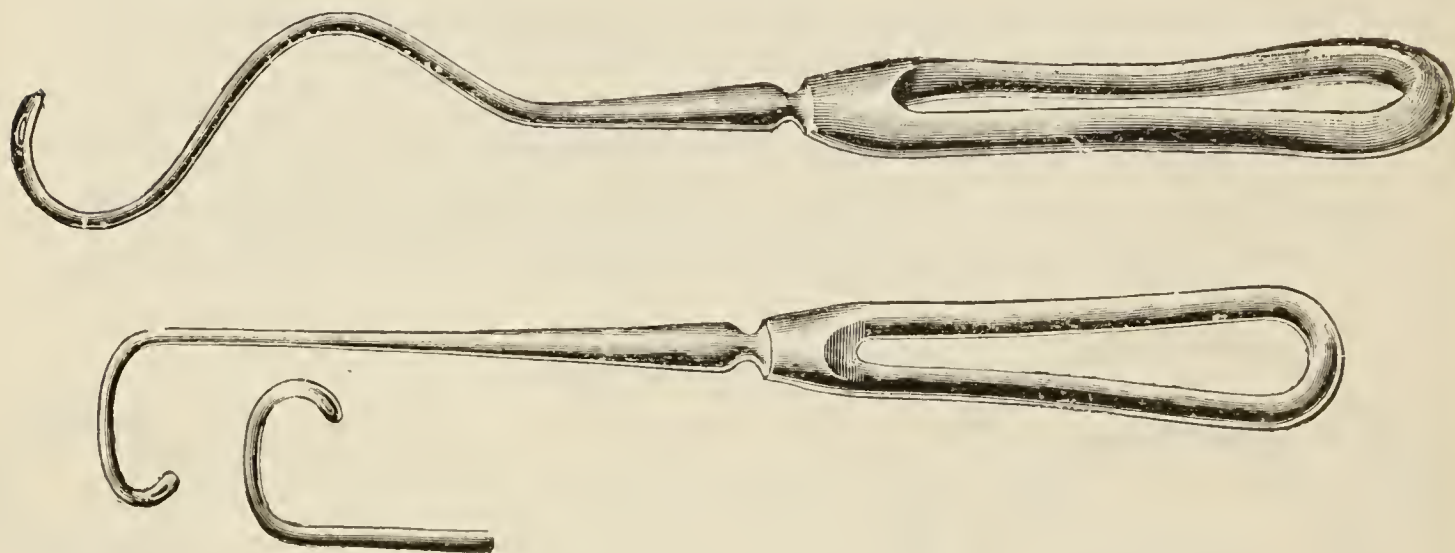
Patterns used by author. The steel of these needles must be carefully tempered so that they will stand both considerable strain in use and also the pressure of the clamp needle-holder.

FIG. 326.—DOYEN'S PERITONEAL NEEDLE-HOLDER, WITH THE EYE BETWEEN THE BLADES FOR THE NEEDLE.

exposure of the bowel have to be vigorously guarded against. The intestines should be covered with warm protectors, wrung out of

sterilized water containing formalin. Maunsell devised a useful guard for this purpose, a frame of copper wire covered with rubber-tubing, over which layers of aseptic gauze are stretched. A sound should now be passed into the bladder. If there be danger of the viscus being wounded, and if it be expanded over the face of the tumour, the sound is a guide to its position. The bladder must then be separated from the tumour by the thumb or piece of dab or sponge on a holder, pushing towards the uterus. Cases have been published in which the bladder reached to the umbilicus. It did so in a case of the author's where the operation was performed for double pyo-salpinx.

If the bladder wall be wounded, it must be immediately closed by gut or fine silk sutures, as in the instances of the intestines. It may be found that it is impossible to deliver the tumour, owing to



FIGS. 327, 328.—OLSHAUSEN'S BROAD LIGAMENT NEEDLES
(STRAIGHT AND DOUBLE CURVED).

There are two sizes of each.

its depth, the extent of the adhesions, and the shortness of the pedicle. It has then to be dealt with by one of the other methods we shall refer to. In clearing it in front, the ureters may be wounded. The degree of laceration and displacement must influence the course to be pursued. The methods of dealing with a divided ureter are considered in the chapter on the Surgery of the Ureters.

Ligature and Division of the Broad Ligaments.—Before proceeding to apply the ligatures, the surgeon carefully examines the adnexa and broad ligaments at either side, ascertaining if there be any tumours or cysts of the adnexa, and the relations of the latter to the tumour. He should get a good idea of the position of the cervix, and the line of utero-vesical-peritoneal reflexion. Any deviation from the usual position or course of the ureters is sought

for, and it may be possible to palpate them in their passage to the bladder. He next proceeds to ligature the broad ligament at one side, using the curved needle of Olshausen for this purpose. If we

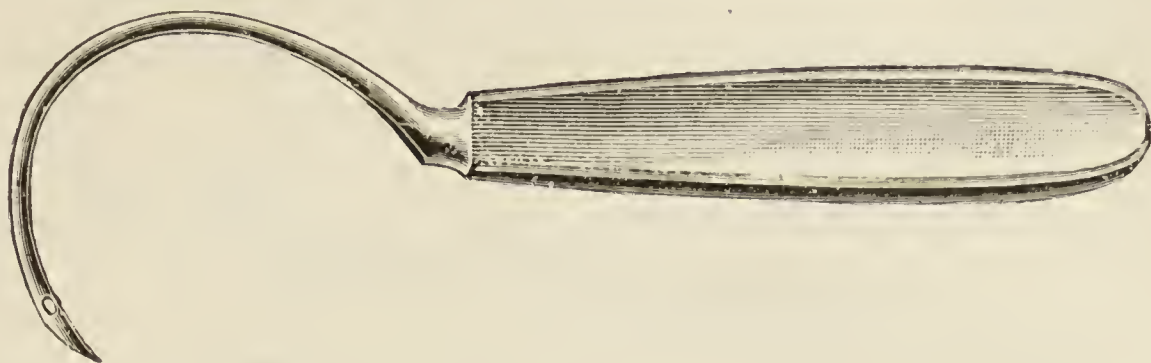


FIG. 329.—OLSHAUSEN'S SHARP CURVED NEEDLE, WITH EYE IN POINT.
(Several curves.)

intend to remove the tube and ovary, a ligature is passed outside these and firmly tied, another is carried close to the uterine wall, and the broad ligament is divided. The same manœuvre is carried out at the other side. The ovarian arteries have now been both secured. Any bleeding vessels on the uterine side can be temporarily caught with pressure forceps.

If the adnexa be healthy, they may be left, or those of one side only removed. The middle portion of the broad ligament to the level of the internal os is next ligatured at either side.

The sound in the bladder indicates the line of peritoneal reflexion and attachment. A curved incision is carried from one broad liga-

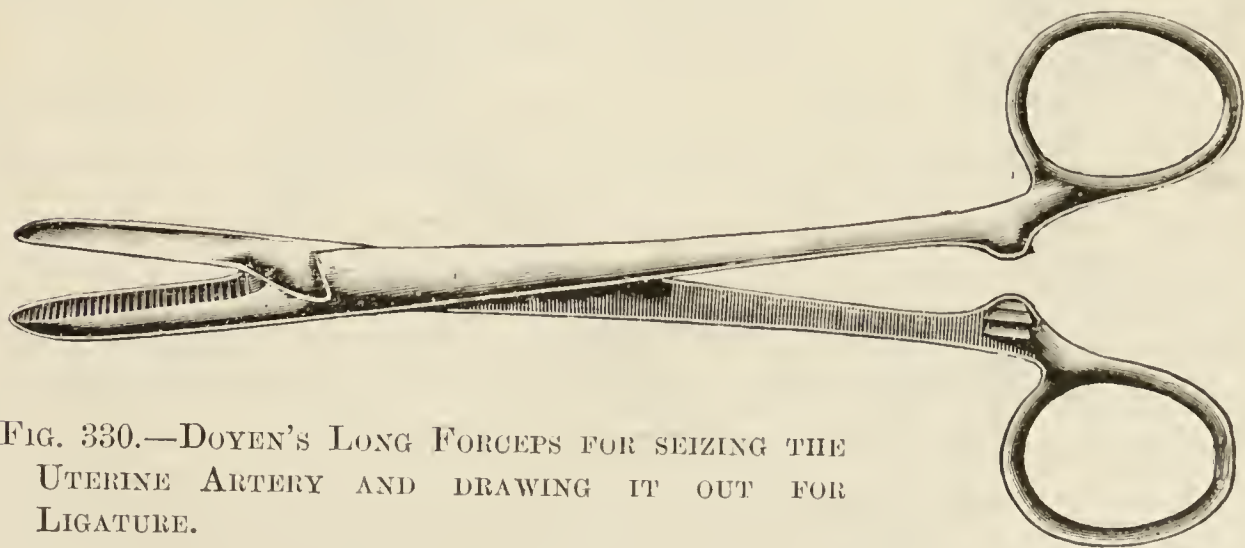


FIG. 330.—DOYEN'S LONG FORCEPS FOR SEIZING THE
UTERINE ARTERY AND DRAWING IT OUT FOR
LIGATURE.

ment to the other, across the anterior surface of the uterus, and through the sub-serous connective tissue. With the thumb or a small sponge on a holder, which is much better, the detachment of the bladder is effected as far as the vagina. An obturator, passed into the vagina and pushed upwards, will indicate the point where the vagina may be opened, which is done by cutting on the

obturator or a long curved forceps, the blades of which can be separated to stretch the anterior vaginal vault and enlarge the opening, with a curved scissors, or the finger may be used for the same purpose. The posterior fornix is now put on the stretch by hooking the finger through the opening just made and drawing on the cervix, while at the same time it is used as a guide, or the cervix may be seized by Doyen's *érigne* (Fig. 342), and drawn backwards and forwards or to either side. The vault is now opened posteriorly. This opening is likewise enlarged with the finger. The next step consists in the ligaturing of the uterine arteries and the severing of the uterus. This involves the avoidance of two most serious accidents—hæmorrhage and a wound of the ureter. The liability to one or other will depend upon the care and deliberation with which the step is conducted, and the probability of either accident occurring will be largely influenced by the character of the

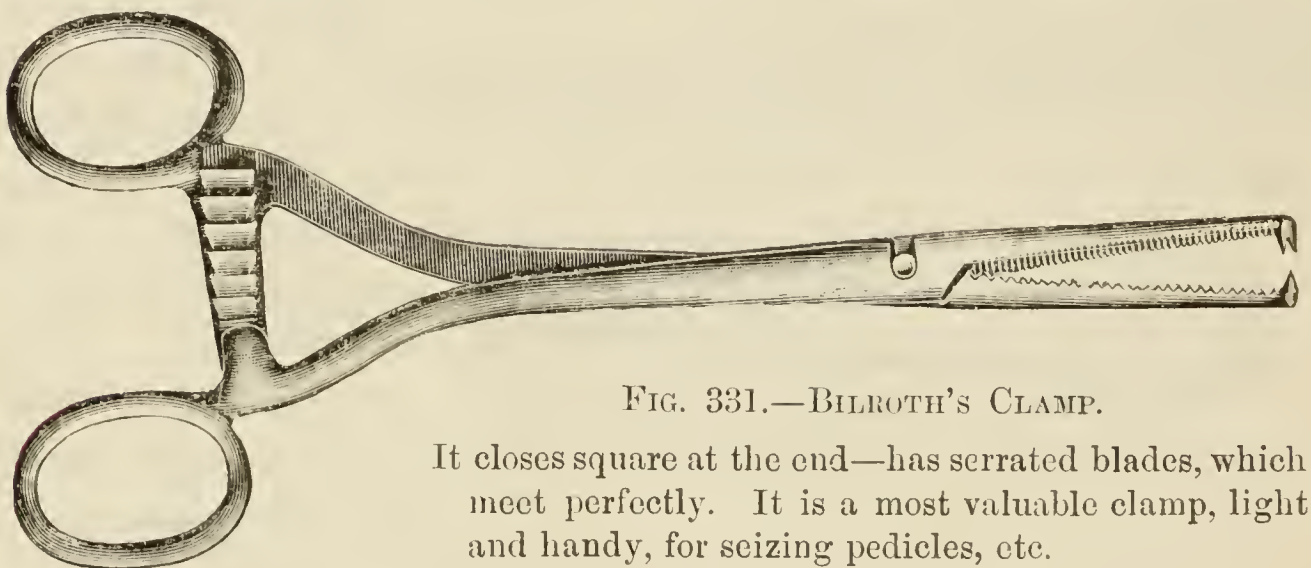


FIG. 331.—BILROTH'S CLAMP.

It closes square at the end—has serrated blades, which meet perfectly. It is a most valuable clamp, light and handy, for seizing pedicles, etc.

tumour, its shape, depth in the pelvis, the height to which the ureters are carried by the mass, and the disposition of the uterine vessels. Sometimes the uterine artery or a branch is wounded unexpectedly through an abnormal division. Should this occur, the trunk is immediately seized with a Doyen's forceps, drawn well out, and tied. The curved needle is passed as close as possible to the uterine neck, so as to avoid the ureter. The curved scissors, with the convexity turned towards the uterus, cuts close into the uterine tissue. This is done at both sides of the cervix, and finally the uterus with its tumour is completely delivered.

Any bleeding points are now sought for, and each in turn is secured with a ligature. The source of any oozing is patiently looked for and controlled, whether in the pelvis or from the cut vaginal surface. This must be done with the patient thrown well into the Trendelenburg position, and, if necessary, by the light of

the forehead mirror (Fig. 319). The pelvis is now thoroughly dried out with damp compresses of sterilized gauze, and, when all is perfectly clean and dry, a roll of iodoform gauze is carried from

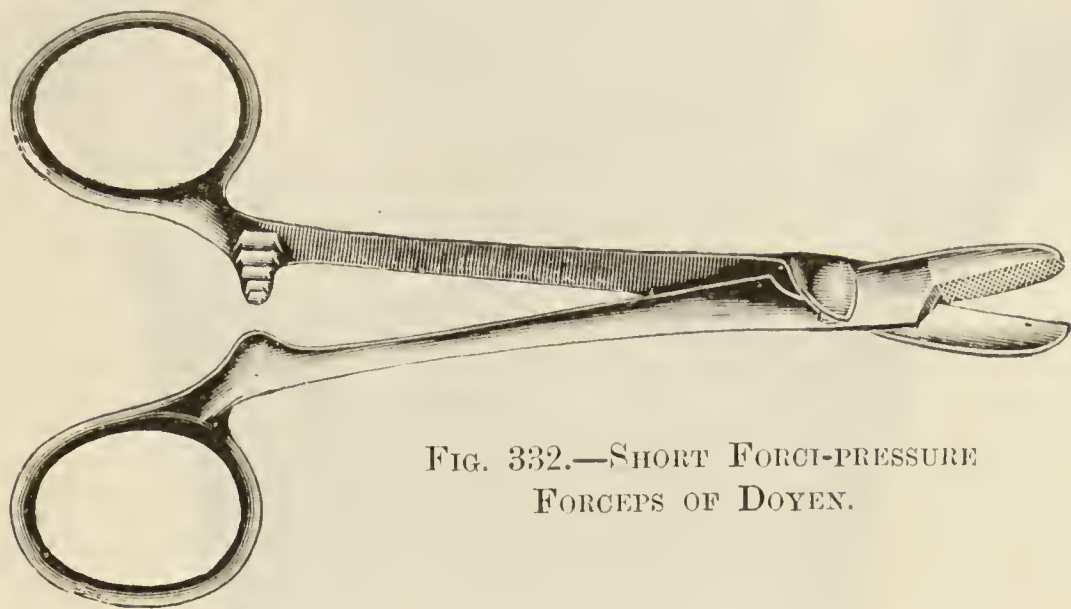


FIG. 332.—SHORT FORCI-PRESSURE
FORCEPS OF DOYEN.

above down into the vagina, a small portion only of it being left projecting into the peritoneal cavity. The peritoneal flaps are now sewn with continuous or interrupted sutures, and any rents in the broad ligament are carefully closed. The pedicles of the adnexa,

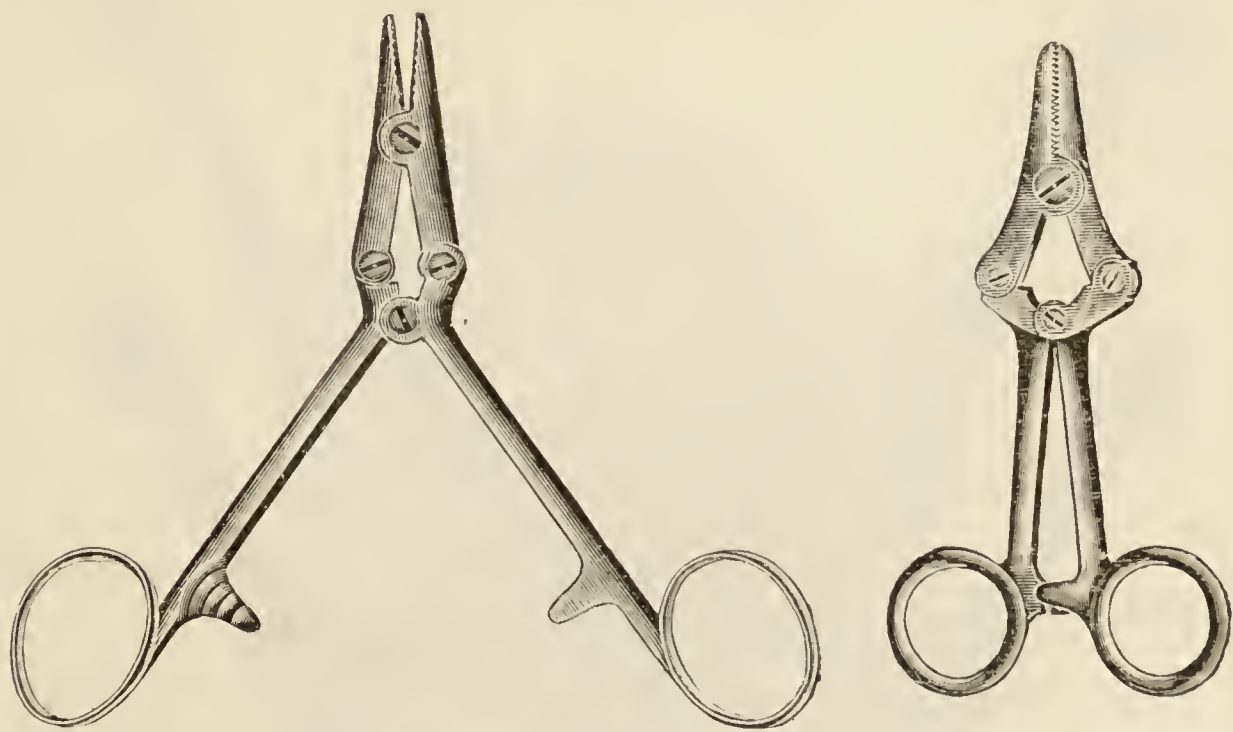


FIG. 333.—ZWEIFEL'S SMALL CRUSHING FORCEPS. FIG. 334.—FORCEPS CLOSED.

These forceps are most valuable. They are about the size of an ordinary Well's forceps. The crushing power at the points is increased threefold by the mechanism of the forceps. They completely control the bleeding from any small vessels if allowed to remain on for a short time.

if the latter are removed, are carefully tucked in and covered with peritoneum. Finally the vaginal opening with the peritoncum is sutured over the gauze.

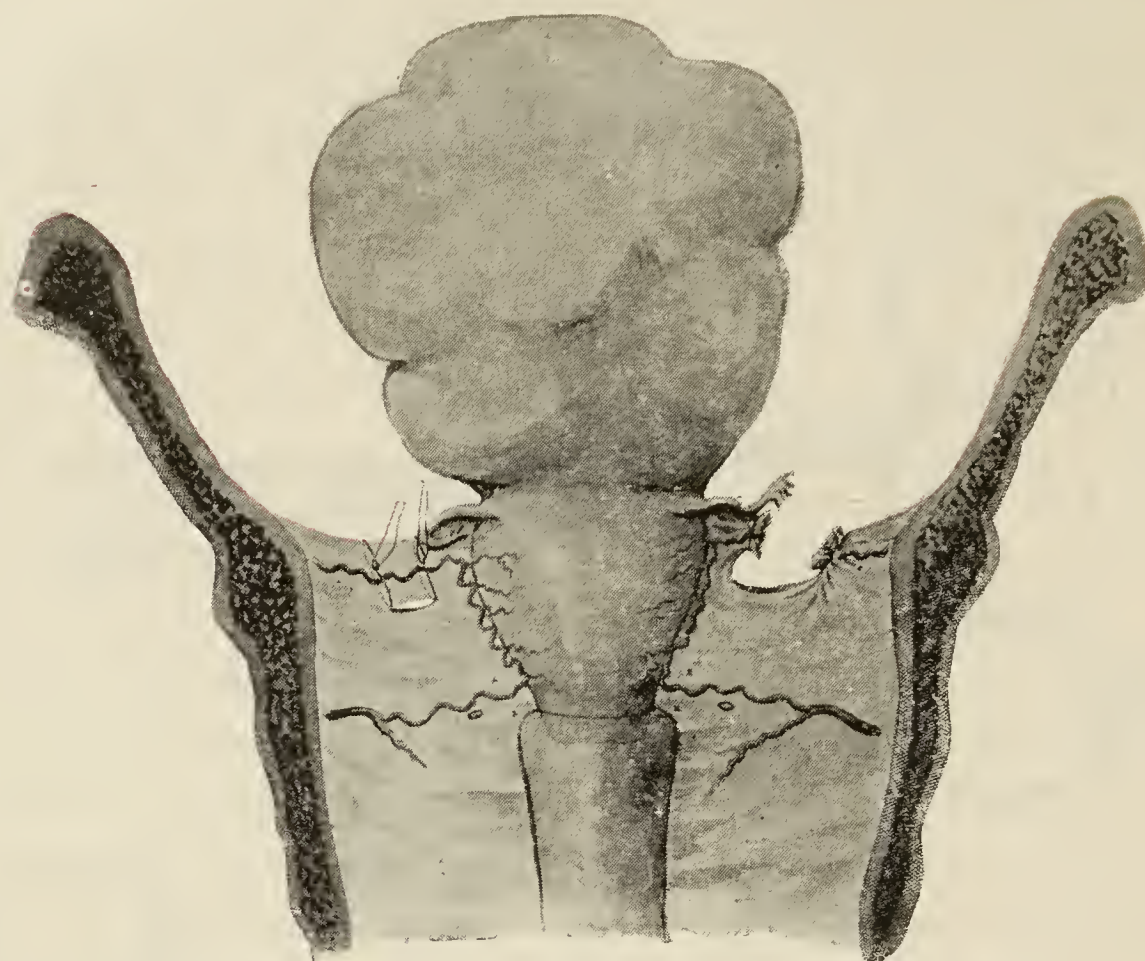


FIG. 335.—PASSAGE OF THE DOUBLE LIGATURE AT UPPER THIRD OF BROAD LIGAMENT. (C. MARTIN.)

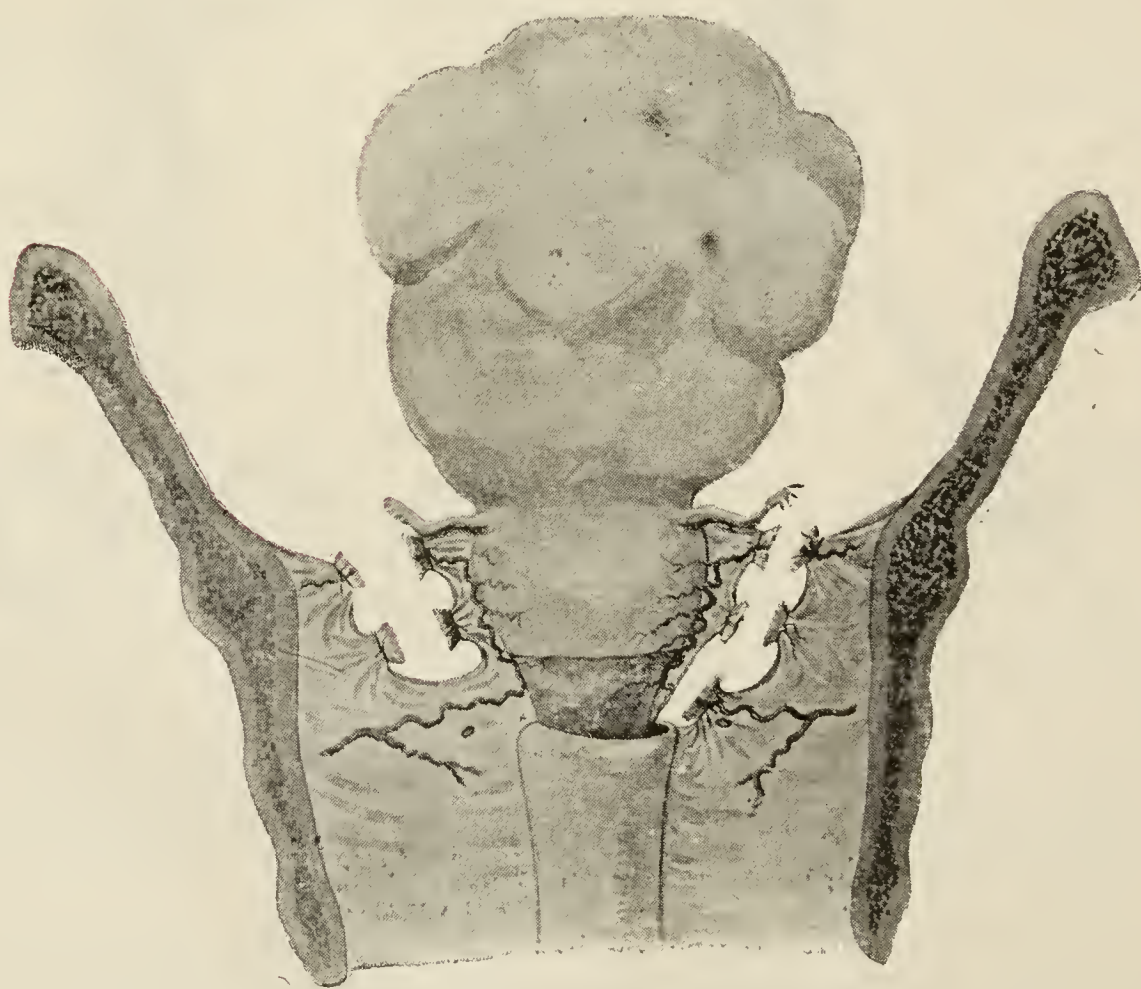


FIG. 336.—SUCCESSIVE LIGATURES OF BROAD LIGAMENT. (C. MARTIN.)



FIG. 337.—LIGATURE CUT SHORT AND PEDICLE DROPPED. (C. MARTIN.)



FIG. 338.—ROLL OF IODOFORM GAUZE DRAWN DOWN THROUGH THE VAGINA, LEAVING AN INCH ABOVE IT. (C. MARTIN.)

Looking down from above on the pelvic basin, in the completed operation no jagged or exposed surfaces are seen, the peritoneal edges are carefully approximated, leaving one continuous smooth and clean surface.

In the hands of the most distinguished operators, adhesions between the intestine and omentum and the abdominal wall, after operation by the abdominal route, and between the intestine and omentum and the edges of the vaginal wound, in vaginal hysterectomy, as well as prolapse of the vagina, occur when the peritoneum is not carefully united in either case.

Should the case have been complicated with severe hæmorrhage, and we fear further oozing, or if there have been such complications as cystic and dermoid tumours, or hæmato- or pyo-salpinx, and the contents of the cysts or sacs have escaped during the operation, it is better to leave the vaginal opening unclosed, and to let the iodoform roll act as an efficient drain. Within a few days the peritoneal cavity is shut off by a layer of encapsuled lymph, and thus infection from below is prevented.

The abdominal toilet is now completed, the peritoneal edges are brought together, and are united by a continuous or interrupted



FIG. 339.—REVERDIN'S NEEDLE.

The needle having been passed through the lips of the wound, the silk or gut is caught in the notch, and it is drawn back. This is the best needle for use if interrupted sutures of silkworm gut be selected to close the skin. The needle is carried rapidly from one margin of the wound to the other, the thread is linked into the slit by an assistant, and the needle quickly withdrawn. The ends are caught in catch forceps, and the tying is rapidly completed when all the sutures are passed. This needle may be had of different curves, or with an eye in the point.

suture of fine gut. The rectal fascia is next raised off the muscle for an inch in width at either side with the finger-nail, the end of closed scissors, or the scalpel. The muscle and fascia are sutured with gut of medium consistence, special care being taken to bring the edges of the fascia into accurate line. (Noble makes its margins overlap, and thus stitches it.) Finally, the skin margins are united with silkworm gut, bronze aluminium wire or celloidinzwirn. I invariably use the latter.

Drainage is rarely required—never when there has been an aseptic operation, and if all bleeding have been thoroughly arrested. If, however, there have been any suppurative conditions of the adnexa, and pus has escaped into the peritoneum, or blood into the pelvic cavity, and there is a certainty of serous oozing following

the operation, it is well to drain.* This may be done either with a rubber tube, which has been sterilized, or by a sterilized iodoform gauze drain. The drain should be removed as soon as possible.

Doyen's Operation of Abdominal Pan-Hysterectomy (with Clamps).

The first stage of the operation is similar to that which has been described. The tumour is then drawn forward by his *hélecoide* (corkscrew tractor). If there be a pedicle, and the tumour can be drawn over the pubes, this is immediately done. His supra-pubic self-retaining retractor is now applied. The bowel is carefully protected, and the extirpation of the tumour proceeded with. The second stage consists in the extirpation of the uterus and the hæmostasis of its pelvic attachments. This part of the operation is performed very quickly, and without the use of preventive clamps. A long curved forceps is introduced into the sterilized vagina, and is pushed behind the neck of the uterus so as to protrude the posterior vaginal cul-de-sac upwards as far as possible. By this means the exact height of the reflection of the anterior



FIG. 340.—HÉLECOIDE, FOR DELIVERY OF TUMOUR. (DOYEN.)

wall of the cul-de-sac of Douglas is defined, and a thick thread of silk is immediately passed about a centimetre above this point. This suture serves, at the end of the operation, to draw up the posterior lip of the peritoneal wound and facilitate the closure of the vaginal orifice. A longitudinal incision, sufficiently free, is next made into the cul-de-sac of Douglas on the point of the forceps, either by bistoury or scissors. The surgeon now introduces the right index finger through the vaginal opening thus enlarged, and carries through it Doyen's *érigne* for seizing the cervix. This is plunged into the anterior lip, or, if this be impossible, the posterior, and by it the neck is securely seized. This is then drawn up between the lips of the vaginal opening. With the left index finger, the lateral attachments are examined, and with a scissors or bistoury these attachments of the cervix, as far as the inferior border of the lateral ligaments, are divided. Strong traction is made with the *érigne* forceps. The anterior vaginal cul-de-sac is now seen, and

* See p. 135 for the various indications for resort to drainage.



FIG. 341.—THE RIGHT BROAD LIGAMENT IS DETACHED FROM THE UTERUS—THE TUMOUR IS TILTED TO THE LEFT—ADNEXA HELD IN THE HAND OF THE ASSISTANT. (DOYEN.)



FIG. 342.—ÉRIGNE OF DOYEN CONVERTED TO GRASP AND HOLD FIRMLY THE CERVICAL LIP OR NECK IN DRAWING IT UP BETWEEN THE LIPS OF THE VAGINAL OPENING.

the anterior lip of the cervix is seized with an ordinary claw forceps, if this be necessary, and the cul-de-sac is divided with the scissors at its contact with the cervix, still drawing forcibly with the forceps or *érigne*. With the right index finger the cervix is carefully separated from the bladder, and there is now no attachment of the uterus left save its lateral vascular connections.

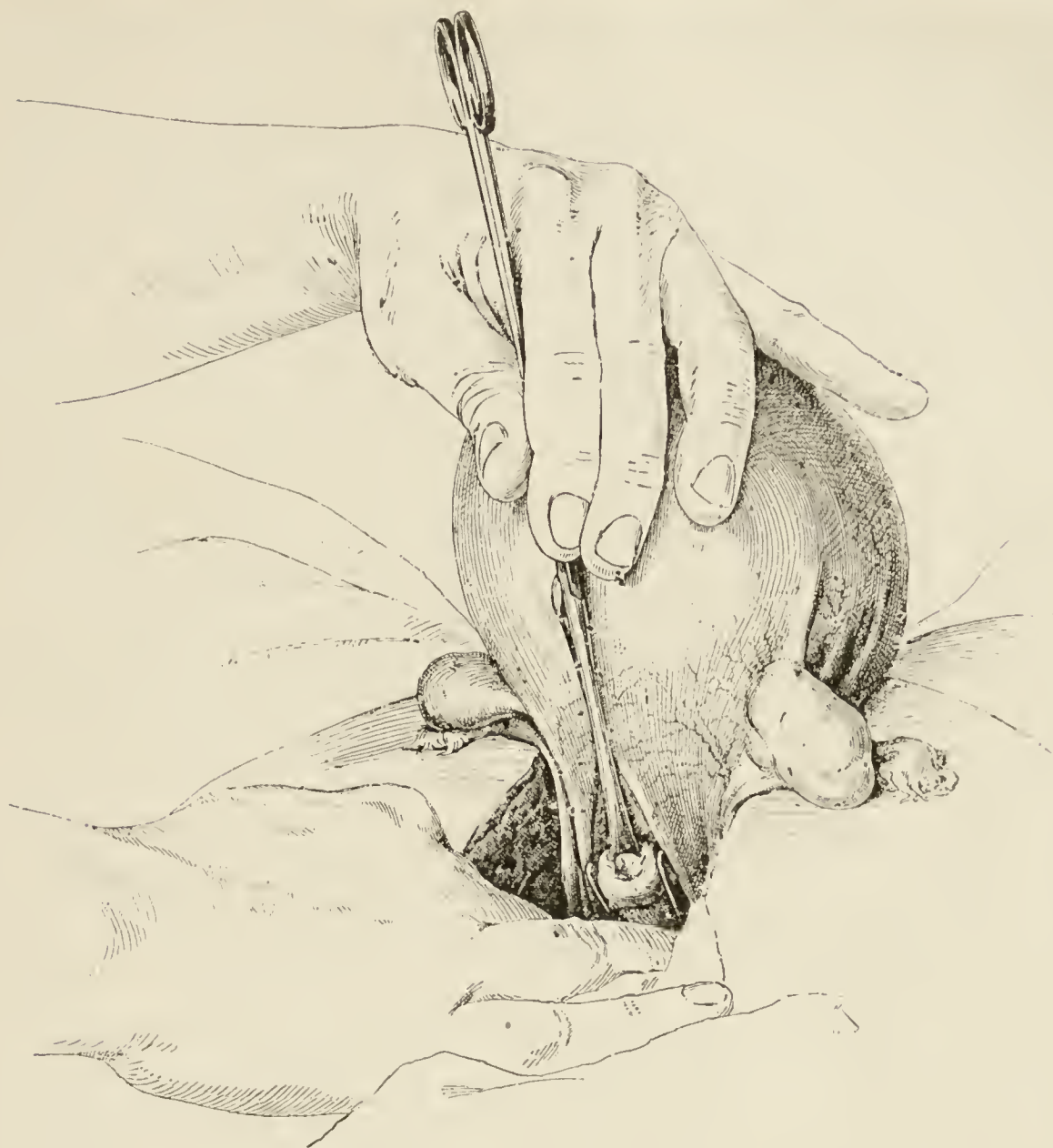


FIG. 343.—OPENING OF THE POSTERIOR VAGINAL CUL-DE-SAC. (DOYEN.)



FIG. 344.—INCISION OF THE ANTERIOR CUL-DE-SAC—RAISING OF THE UTERINE NECK AFTER ITS DETACHMENT FROM THE BLADDER. (DOYEN.)

It only remains to introduce the left forefinger above the right broad ligament in order to perforate the utero-vesical peritoneum, and, with the curved finger, to complete the detachment of the right broad ligament. As this is separated, it is seized between the finger and thumb by an assistant, and cut between the adnexa and the uterus. The tumour is now rapidly depressed towards the left; its anterior serous envelope is divided, if it offer any resistance, as far as its connections with the left broad ligament. Nothing now retains it save the other border of the latter, which a stroke of the scissors divides, and the uterus is free. As in the case of the right, the left broad ligament is seized by the fingers. In favourable cases, there is scarcely any bleeding, save some small jets from the uterine and utero-ovarian vessels occurring at the moment of the extraction of the uterus. This latter result is obtained by the section being carried so close to the uterine tissue that the main trunks of the vessels are not divided, but only their smaller internal branches. A few ligatures at each side are sufficient in the simpler cases to secure the uterine arteries and their principal branches. The right adnexa are now removed and resected by transfixion of the pedicle, which is tied circularly by a silk ligature. The left are treated in the same manner, and these ligatures are held by two hæmostatic forceps. The pelvic cavity is sponged, and cleansed of any blood remaining. The suture of silk which was placed posteriorly at the commencement of the operation is now drawn on, the vaginal mucous membrane is seized with one or two long-toothed forceps, and it is united by two or three sutures with the peritoneum. The ends of the ligatures tying the tubo-ovarian pedicles are now drawn into the vagina with a long curved forceps. The pelvic peritoneum has to be closed. The cul-de-sac of Douglas is sponged and dried, the pedicles of the adnexa at either side are covered, and, in effecting this closure of the peritoneum, care has to be taken not to wound the vessels. Should this occur, they are immediately tied. Doyen closes the entire pelvic peritoneum by a purse-string suture, taking in the posterior circumference of the peritoneal wound, the adnexal pedicles, and the vesical peritoneum. It may also be closed in the usual manner by interrupted sutures. Any lateral tear is carefully repaired. The toilet of the pouch of Douglas is then terminated, the compress is placed in the pelvis at this point, and the table is replaced in the horizontal position. The abdominal wound is then closed. In certain cases, such as shortness of the broad ligaments, thickening of their upper border, with which is associated hypertrophy of the round ligaments, there is considerable resistance to the raising of the tumour through their attachments to the fundus. In such cases he divides the ligament, and temporarily secures it with hæmostatic forceps.

In his later *cælio-pan-hysterectomy*, when the vagina has been opened in front and behind, and the cervix liberated from the bladder, the broad ligaments are seized and held by the angiotribe, the pedicles are crushed, tied, and divided at either side, the uterine arteries are next tied, and the angiotribe is removed. A purse-string suture is carried from the retro-uterine peritoneum to that between the right adnexa and the bladder, this throwing the stump of the right adnexa below the peritoneum. The stump of the left adnexa is treated in a similar manner, and a continuous suture is carried

from left to right, approximating the retro-uterine peritoneum to that of the bladder.

Prolonged and Obstinate Hæmorrhage.—Should this occur low down in the pelvis, the Trendelenburg position at an angle of 45° must be obtained; the bowel is carefully drawn up and protected. Strong artificial light, by the electric lamp or forehead mirror, is thrown into the pelvis; the sources of the bleeding determined, and ligatured, if necessary, with Schauta's ligature tightener. If there be general oozing, or the patient's condition forbids further efforts to see and secure vessels, a sterilized gauze pack should be tightly packed over the bleeding surface. With the long, light clamp needle-holder of Olshausen, it is not difficult to carry a fine needle deep into the pelvis, and, by dipping it, secure the bleeding vessel or vessels.

Shock during Operation, or immediately after.—When any or all of the conditions I have enumerated so complicate an operation that its duration is considerably prolonged, or there has been such loss of bleeding that the patient's life is endangered, shock may occur, and demand immediate attention. A subcutaneous injection of ether or strychnine should be given, a stimulating enema may be passed into the bowel, and a sub-mammary injection of artificial serum administered. The anæsthetist is the one who is mainly responsible for the recognition of the symptoms ushering in shock: increased rapidity, with failure, of the pulse, growing pallor, weakness of the respirations, and cold perspiration should warn him of the danger.

After a long operation, when complications such as those mentioned have to be overcome, once the abdominal toilet has been made, which should be done as rapidly as possible, the patient must be moved from the operating-table with gentleness, and steps taken immediately to secure a proper temperature and the application of artificial warmth to the lower extremities. Should the symptoms of shock continue, another stimulating enema may be given after placing her in bed, and a second subcutaneous injection of ether, to be followed in a little time by one of strychnine.*

Accidents.—That accidents during hysterectomy are not so uncommon as some would represent, may be realized from the results in Chrobak's klinik alone during two years. The ureters suffered in fifteen cases, one ureter in eleven, both in four, and the bladder itself in twenty-one. There were

* For full instructions regarding the treatment of post operative shock, see remarks on after management of the case.

fourteen injuries to the bowel, seven abdominal, and seven vaginal. Twenty-one of these accidents proved fatal.*

Jessett records a case of adherent transverse colon embedded between two large fibroids, the distal portion of the intestine being drawn quite taut over the lower tumour, and in such close juxtaposition to the left broad ligament, behind which it lay, that it was enclosed in the tubo-ovarian ligature and divided. The accident was not discovered until the tumour was examined after removal. An artificial anus was made at the proximal end, and the distal portion invaginated. Death occurred on the fifth day.

Splenic Flexure of Colon buried in Adhesions—Colon Adherent to Parietal Peritoneum—Stomach dilated, thickened, and the Cardiac End held by Adhesions to the Colon.—I recently removed a myoma in a case in which there had been abdominal pain on and off, with chronic invalidism for twenty years. There had been long spells of vomiting, for which morphia had been freely used. Pain was principally felt at the left side. The patient had a mobile right kidney. A year previously I had refused to operate, believing that her symptoms did not altogether arise from the tumour, but as these had increased during the year her physician and friends desired to have the operation. The tumour extended into the broad ligaments at either side. During operation she vomited some blood, and after it was over persistent vomiting continued in spite of all that could be done, until she died on the fourth day. I was permitted a partial autopsy, at which I found the descending colon adherent to the parietal peritoneum by dense adhesive bands to the extent of three inches. The splenic flexure was buried in a tunnel of adhesions for the extent of some four inches. The stomach was much dilated, and its coats thickened. The cardiac end of the stomach was held by adhesions to the colon. Before death I had opened the abdomen, suspecting that there might be some intestinal complication, but discovered none. There was no tympanites until shortly before she died.

Bumm's Operation.†—A practically bloodless pan-hysterectomy is that of Bumm, who does not favour the supra-vaginal method. It is specially suitable in the case of myomata which do not extend far into the broad ligaments, and in malignant disease limited to the uterine cavity and cervix, or cases of deciduoma malignum and certain cases in which the uterus may have to be removed from hæmorrhagic and other forms of endometritis. The steps of the operation are as follows :—

The vagina having been rendered thoroughly aseptic, it is incised posteriorly and the pouch of Douglas opened. Any bleeding vessels are ligatured. Otherwise, a sound is passed into the posterior fornix, and maintained there by a gauze tampon. The abdomen is now opened, the tube and ovary, preferably of the left side, are

* *Blau Bettræge z. Geb. u. Gyn.*, bd. 18, heft i.

† For Bumm's radical operation for cancer of the uterus, see chapter on Cancer.

drawn towards the uterus, and two Kocher's clamp forceps are applied. The ligament is divided between the two. Only a few minutes are thus occupied. Two other pairs of forceps are now passed as far as the upper margin of the bladder in an oblique direction inwards towards the uterus, and the peritoneum divided between these. The same manœuvre is carried out at the right side. The finger now pushes the ureter aside, and seeks for the uterine vessels, which are separated, drawn out, and clamped. Two pairs of forceps are again applied at either side, both vessels being thus secured. The division is then carried on as far as the

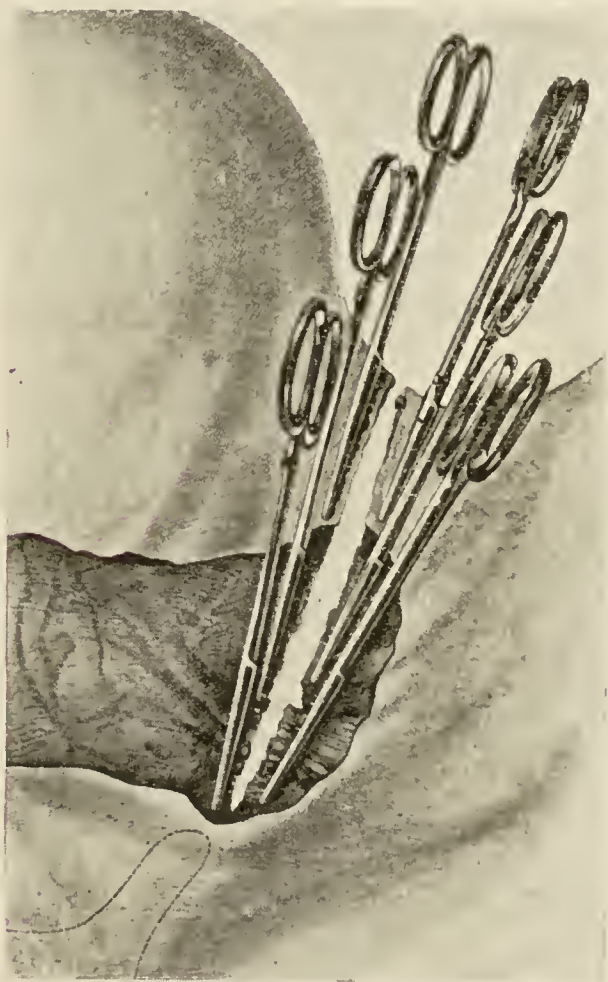


FIG. 345.—SIX PAIRS OF KOCHER'S FORCEPS APPLIED TO THE DIVIDED BROAD LIGAMENT. (BUMM.)

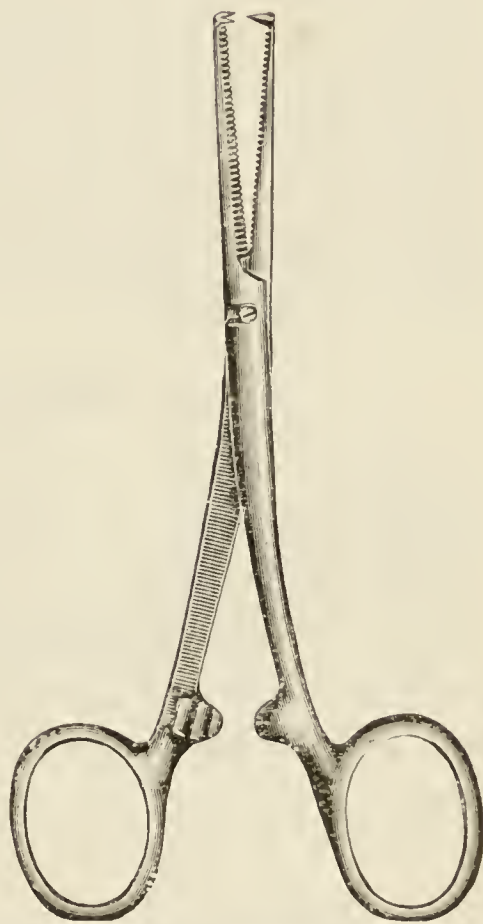


FIG. 346.—KOCHER'S FORCEPS.

fornix of the vagina. Should the posterior cul-de-sac have been previously entered, the anterior, which is drawn upwards, is opened through this aperture, otherwise the finger of an assistant pushes the anterior fornix upwards, and it is thus incised. A fourth pair of the forceps now take in the divided lateral parts of the vagina and the folds of Douglas, the incision being carried on between the clamps. The uterus is now completely detached and removed. The vaginal wound is carefully adjusted, and ligaturing of the broad ligaments is proceeded with from above down, the thumb

and fourth finger being used for temporary compression, while the ligation is made with thin catgut. Thus, in their order, the tubo-ovarian vessels, those of the round ligament, the uterine

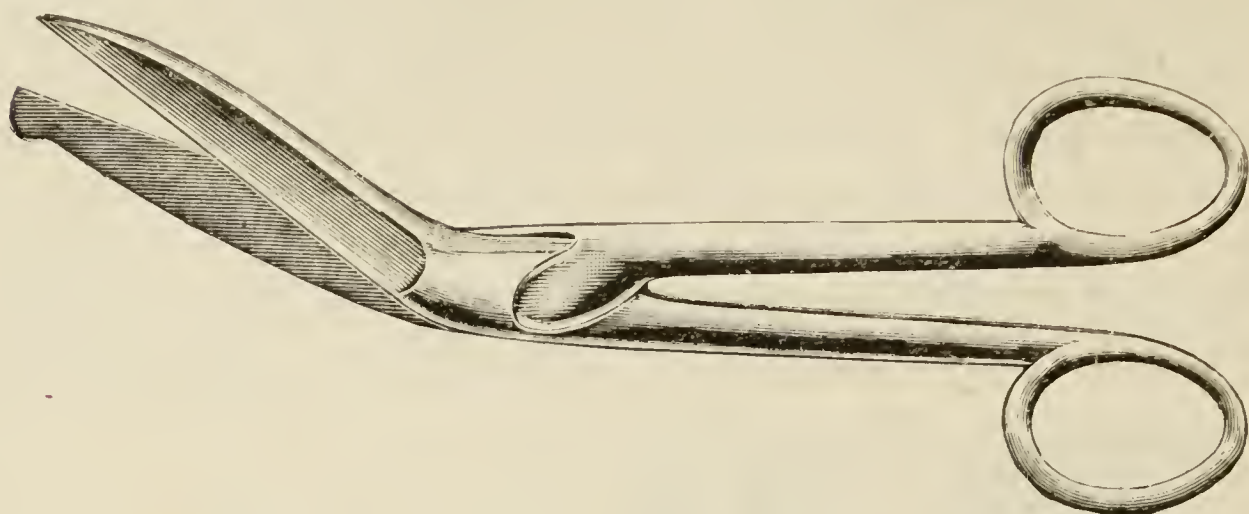


FIG. 347.—BLUNT-POINTED SCISSORS.

arteries and veins, and, lastly, the folds of Douglas, are secured. The obliquely running wound in the pelvic peritoneum is closed by continuous suture, from the upper angle at one side to that of the other. The vagina is then tamponed loosely with gauze.

Electrothermic Hæmostasis.

In lieu of ligature, clamp, forci-pressure, or the lever *pince* of Doyen, the method of *angiotripsie*, or forci-pressure, introduced by Skene, of Brooklyn, in which pressure by heat is utilized by a special forceps or clamp heated by electricity, has been more generally resorted to of late years. These special advantages are claimed for it: * the tissues do not slough, and it enables us to act on a large

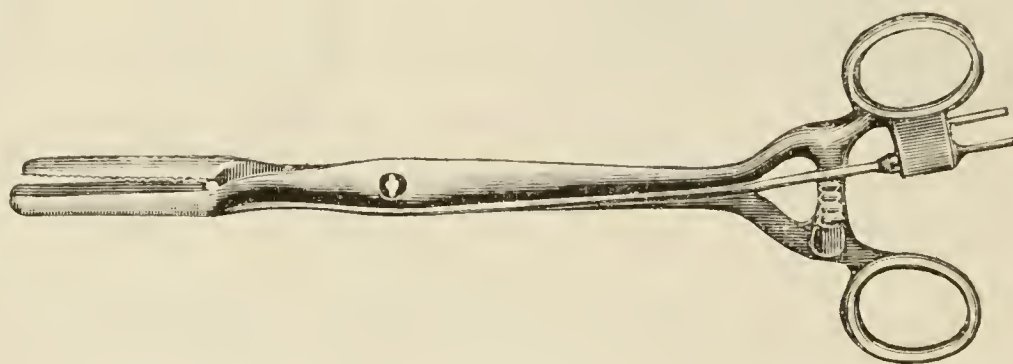


FIG. 348.—ELECTRO-HÆMOSTATIC CLAMP FORCEPS OF JACOBS.

surface, including the tissues that separate the vessels; it is clean and rapid in its action, is disinfectant, permanent in its effects, and prevents the spread of infection, while it lessens the chances of adhesions. Skene first realized the principle that hæmorrhage can

* Jacobs, *Revue de Gynécologie*, July, Aug., 1899; also *American Gynecology*, July, 1903.

be controlled by the modern method of securing the vessels as they emerge from the pedicles under the peritoneum by means of electrical hæmostasis.

Jacobs uses an ordinary forei-pressure forceps, one of the branches of which has its blade hollowed so that the interior of this small cavity contains a platinum wire completely insulated by incombustible material. One end of the wire is joined to the blade itself, while the other is attached to an insulated copper wire which extends for the length of the forceps to its handle, where there is a small block of metal. In this the copper wire is insulated, and, passing through it, ends at a few centimetres from it. Another short copper wire is attached to the block close to the handle. The instrument can be thoroughly sterilized and then used like any other forei-pressure forceps. The electric current passing through the copper wire heats the platinum in the forceps blade. The electricity can be obtained in the usual manner from the ordinary main, and a rheostat is interposed so as to regulate the strength of the current according to the size of the instrument and the end there is in view. A flexible cable enables us to apply the instrument at a distance from the electrical source, and it is so insulated and jointed that the termination of its wires is directly continuous with those of the instrument. The idea of this method is to compress between the blades of the forceps a part of the tissues adjacent to the end of a vessel, expel as much blood as possible, and then secure complete desiccation by the heat developed in the forceps. The necessary temperature is a heat which neither bruises nor chars the

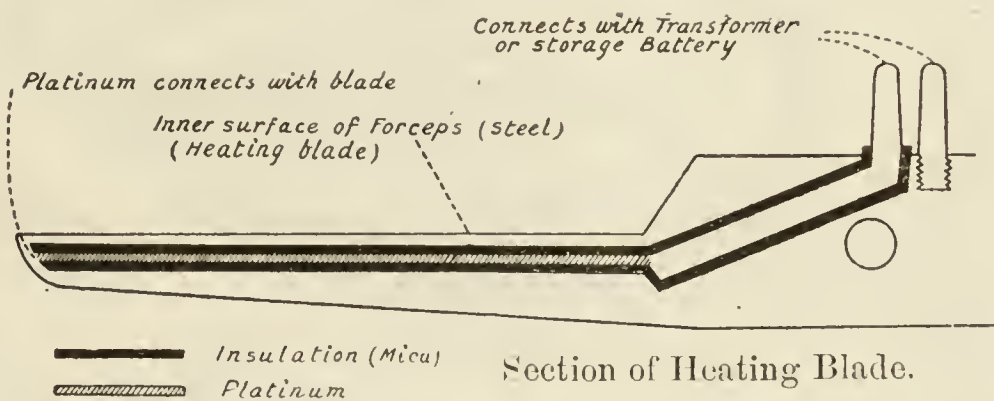


FIG. 349.—DOWNES' ELECTRO-HÆMOSTATIC LEVER ANGIOTRIBE.*

tissues. The instrument can be sterilized along with the others necessary for an operation. When applying it a little sterilized vaseline should be smeared along the blades of the forceps, so as to prevent adhesion of the tissues. The end of the cable can be sterilized in boiling water and then wrapped in a compress of sterilized gauze. In applying the forceps the tissue immediately joining the vessel is insulated, so as to avoid the effects of radiation; connections are now completed, and the current is passed.

Fig. 350 shows the cable and coupler of Downes. A rheostat is interposed so as to regulate the strength of the current and the time necessary to produce the desiccation. This being effected, the current is closed, and the

* All the previous instruments used by Jacobs and others have been superseded by those of Downes, p. 498.

tissue which extends beyond the blades of the forceps is cut. The forceps is now opened cautiously so as not to tear the tissues. The time necessary for the desiccation is from a half to two minutes. According to Downes, 'a complete electrothermic outfit consists of a few angiotribs with blades of different widths, including one with curved blades, the shield, the cautery knife, the artery forceps heater, the cable, the electric current controllers, consisting of the motor transformer, for use with the continuous current, and a transformer for the alternating current. With this outfit and a sufficient number of ordinary hæmostatic forceps any hæmostatic problem in surgery can be solved.'

Looking at the calibre of the vessel which has been compressed, it has a flattened appearance somewhat resembling parchment, and the compressed tunic becomes translucent. The dried portion, after it has been well soaked in water, remains firm and unbroken, and any dissection of the component parts of its tunics is impossible, nor can we recognize its various elementary structures with the microscope. The adjacent tissues undergo the same

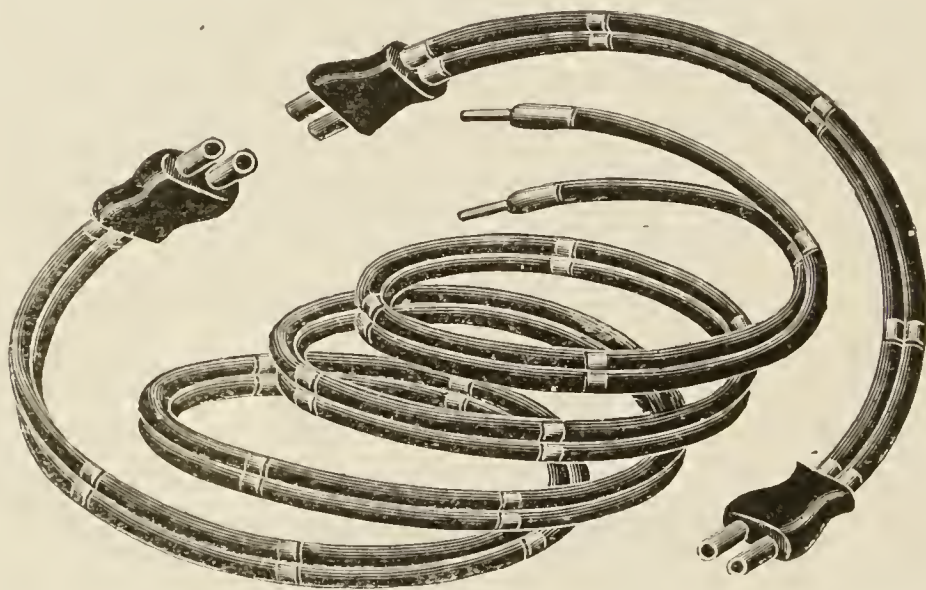


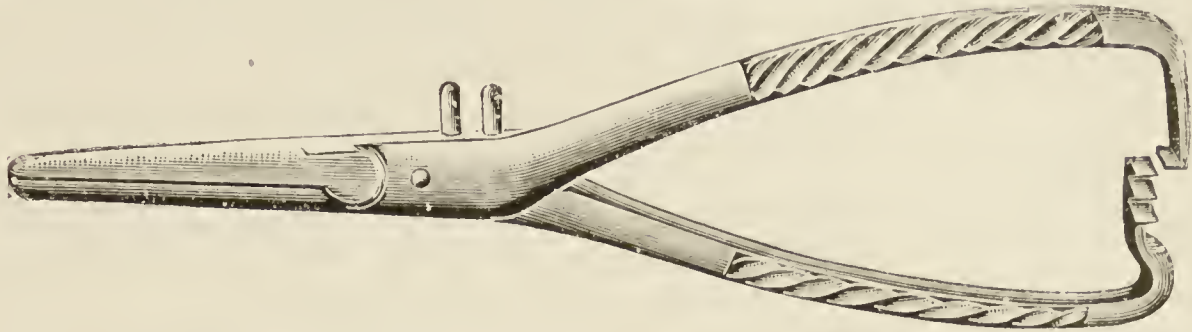
FIG. 350.—DOWNES' STERILIZABLE CABLE TO STORAGE BATTERY WITH COUPLER.

changes. The lumen of the vessel is with difficulty determined. Identical results follow the application of the instrument to the vermiform appendix, nor can any trace of the mucous elements be found.

Downes (Philadelphia) claims special advantages for his modification of the electrothermic angiotribe, in its simplicity of, and exactitude in, application. According to him, 'pressure, approximately that of a medium-sized angiotribe, is applied to the tissue to be hæmostased, and the compressed ribbon thus formed is rapidly submitted to a temperature of not under 212° Fahr., thus coagulating and agglutinating under pressure its albuminous constituents. In addition, the heat even travels a short distance beyond the area compressed into the adjacent tissue and causes a shrivelling of the intima of the bloodvessel leading into the compressed ribbon. Clotting, therefore, occurs a considerable distance beyond the ribbon. The possibility of hæmorrhage after proper technique is inconceivable.'

'**Hysterectomy.**—In vaginal hysterectomy for benign disease, the cervix is encircled by the cautery knife and dissected back until the peritoneal reflections are reached and the abdomen thus entered. The fundus is brought out

through the anterior incision and the $\frac{3}{8}$ -inch or $\frac{1}{2}$ -inch blade of the angiotribe applied to the broad ligament. Sometimes the whole broad ligament can be included in one grasp of the blades, but usually two grasps are required. The first should be applied from the tubal side down, to include the round



FIGS. 351.—DOWNES'S ELECTRO-HÆMOSTATIC ANGIOTRIBE.*

ligament, the remainder of the broad ligament should then be included in a second grasp. The shield is placed around the blades of the angiotribe and the current turned on for from thirty to forty seconds. A temporary hæmostat is applied to the uterine side of the broad ligament, section made along the uterine side of the thermic blade, the angiotribe released and removed, exposing a white ribbon within the blades of the shield. On removing the shield the hæmostased ribbon shrinks back into the pelvis. We have now

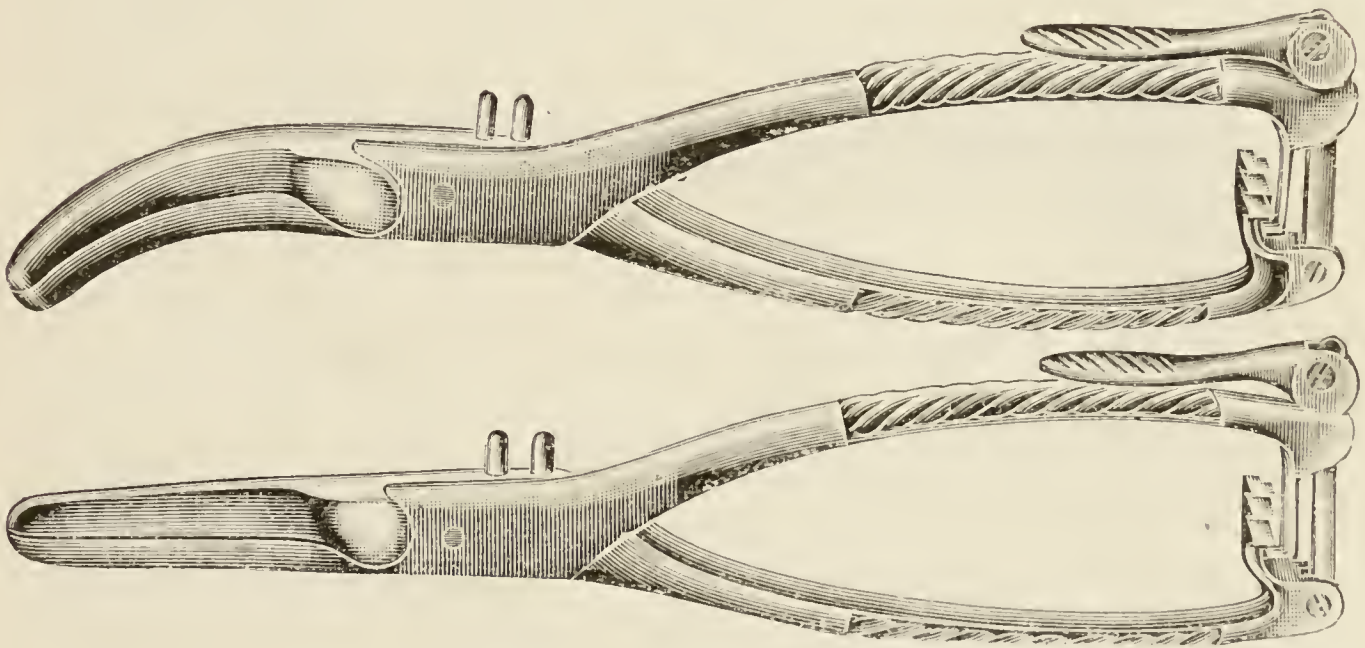


FIG. 352.—ELECTRO-HÆMOSTATIC ANGIOTRIBES, CURVED AND STRAIGHT, WITH BLADES $\frac{3}{8}$ OR $\frac{1}{2}$ INCH WIDE.

Have a lever at end of handles to maintain maximum pressure. Blades released on removal of lever.

the uterus free on one side with temporary hæmostats to control reflux bleeding. The same procedure is now followed on the opposite broad ligament, and the uterus removed by section along the uterine side of the thermic blades. The usual toilet of the peritoneum can then be accomplished. In those cases in which hemisection facilitates removal, the cautery knife can be used in place of the scalpel, and the angiotribe then applied to the broad ligaments, one or two grasps to each.'

For malignant disease, in suitable cases Downes uses the following method

* *Amer. Med.*, Vols. III., IV., VI., May 24, 1902; Dec. 20, 1902; Nov. 28, 1903.

for vaginal hysterectomy: 'The cervix is encircled by the cantery knife through the mucons membrane quite above the visible evidence of disease, and dissected up, using the cantery for searing, until one and a half inches of the cervix is exposed, or until the level of the internal os is reached, when the cervix is amputated by the cautery knife. The cervical canal of the remaining uterus is thoroughly burned and stuffed with gauze. In carrying out the foregoing procedures, should any paracervical bleeding occur that the cautery knife will not hæmostase, the bleeding points should be grasped by the ordinary artery forceps, which can be heated by applying the artery forceps heater to their tips for a few seconds. In some cases the lower branches of the uterine artery in the base of the broad ligaments may need to be hæmostased; in these the tips of the narrow-blade angiotribe are very serviceable. It is even possible without opening the peritoneal cavity to apply the narrow blades along the sides of the uterus, so as to occlude the uterine artery. After removing the malignant cervix, the vagina is resterilized the peritoneal reflections are entered, and the remaining portion of the uterus removed as in the description for non-malignant cases. The procedure here advocated is aseptic and removes the danger of contamination.

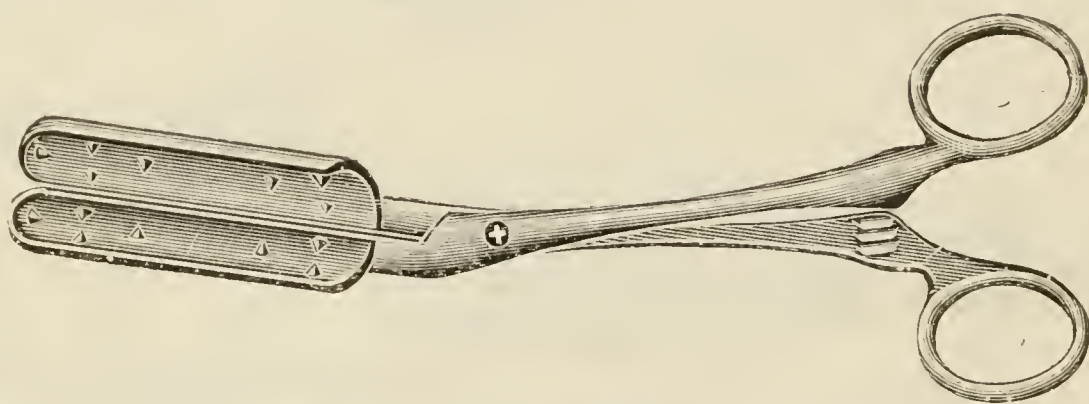


FIG. 353.—DOWNES' SHIELD FOR SURROUNDING THE BLADES.*

'In malignant cases in which it is preferable to remove the uterus through the abdominal incision, the preliminary amputation of the cervix as described, without opening the peritoneal reflections, followed by the removal of the remainder of the uterus through the abdomen, renders the operation free from the danger of implantation. The abdominal part of the operations in these cases could follow any known technique or that now to be described.

'**Abdominal Hysterectomy.**—In abdominal supravaginal and panhysterectomies a variety of procedures may be carried out, of which the following are types. The $\frac{3}{8}$ -inch or $\frac{1}{2}$ -inch blade of the angiotribe is placed on the broad ligament from outside the ovary to below the round ligament, the shield applied, the current allowed to act for about forty seconds, a temporary broad ligament forceps applied to the uterine side, and section made along the adjacent side of the thermic blades. The angiotribe is removed and a wide hæmostased ribbon is seen in the grasp of the shield, on removal of which it shrinks toward the pelvic wall. The same procedure is carried out on the opposite ligament. The broad ligaments are now both hæmostased and sectioned to below the round ligaments, the reflux bleeding from the

* The field should be dried and freed of blood before the angiotribe is applied.

uterine side being controlled by forceps. The bladder is next freed and pulled forward away from the uterus. This puts the ureters on the stretch and makes the occlusion of the uterine arteries easier and safer. The next grasps of the angiotribe are made to include each broad ligament from below the round ligament down to the sides of the cervix so as to include surely the uterine arteries. Section is made on the uterine side of the blades, and the uterus is thus released so that on upward traction it is held only by its vaginal connection, in which perhaps are the vaginal branches of the uterine artery. By putting the vaginal tube on the stretch it is easy to include progressively small portions of it in the narrow blades, and thus sever the uterus bloodlessly by section through the vagina below the cervix, but above the blades; or when this stage is reached a curved angiotribe may be used and the vaginal tube clamped in one bite.

‘In cancer of the uterus, when entire operation is done through the abdomen, two curved clamps can be applied below the cervix to occlude the vaginal tube, the lower one being electrothermic, and the upper any ordinary cold clamp. On section between these curved blades, the vagina is occluded below the cervix so that no contamination is possible. We thus carry out Werder’s method, using electrothermic hæmostasis in place of ligatures. If the operation be a supravaginal hysterectomy, after the occlusion of the uterine arteries section is made across the cervix, and sutures applied as in the usual operations. Before suturing, the cautery knife should sear the cervical canal. It is possible by making a proper wedge-shape amputation at the cervix to use an angiotribe with blades especially devised, that would easily occlude without suture the opposing section of cervix. The technique in abdominal or vaginal hysterectomy may vary from the above description in that the wide blade if used carefully can be made to give a hæmostased ribbon in the broad ligament through which section can be made without the necessity of temporary clamps. If this be done, incision through the broad ligaments can be absolutely bloodless. In using the broad clamp thus, a little more time should be used for the cooking process, yet not enough to cook so thoroughly that the tissues adhere too strongly to the blades of the angiotribe. There is no method of hysterectomy that has ever been performed by ligatures in which we cannot use electrothermic hæmostasis. We can begin at the top of the broad ligament, go down one side, across the cervix, and up on the other side. We can isolate individual arteries and hæmostase them alone by pressure and heat. We can hemisect the uterus from the abdominal side and hæmostase from the uterine arteries upward. We can perform Doyen’s operation, replacing the temporary clamps on the ovarian and uterine arteries by the blade of the angiotribe.’



FIG. 354. — DOWNES' ELECTRO-THERMIC CAUTERY KNIFE.

We have another good example of the effects of this form of hæmostasis in its application to the pedicle of an ovarian cystoma, and this has to be remembered, that where such a result is desirable it produces an occlusion of the lymphatics, and thus opposes an obstacle to the spread of infection; further, so contracted is the surface of the divided pedicle that it does not offer any bleeding surface calculated to contract adhesion with surrounding structures. In those cases in which the friability of the tissues renders the application of a ligament difficult and risky, electro-hæmostasis is complete and safe. During ovariectomy and hysterectomy, if there be omental or intestinal

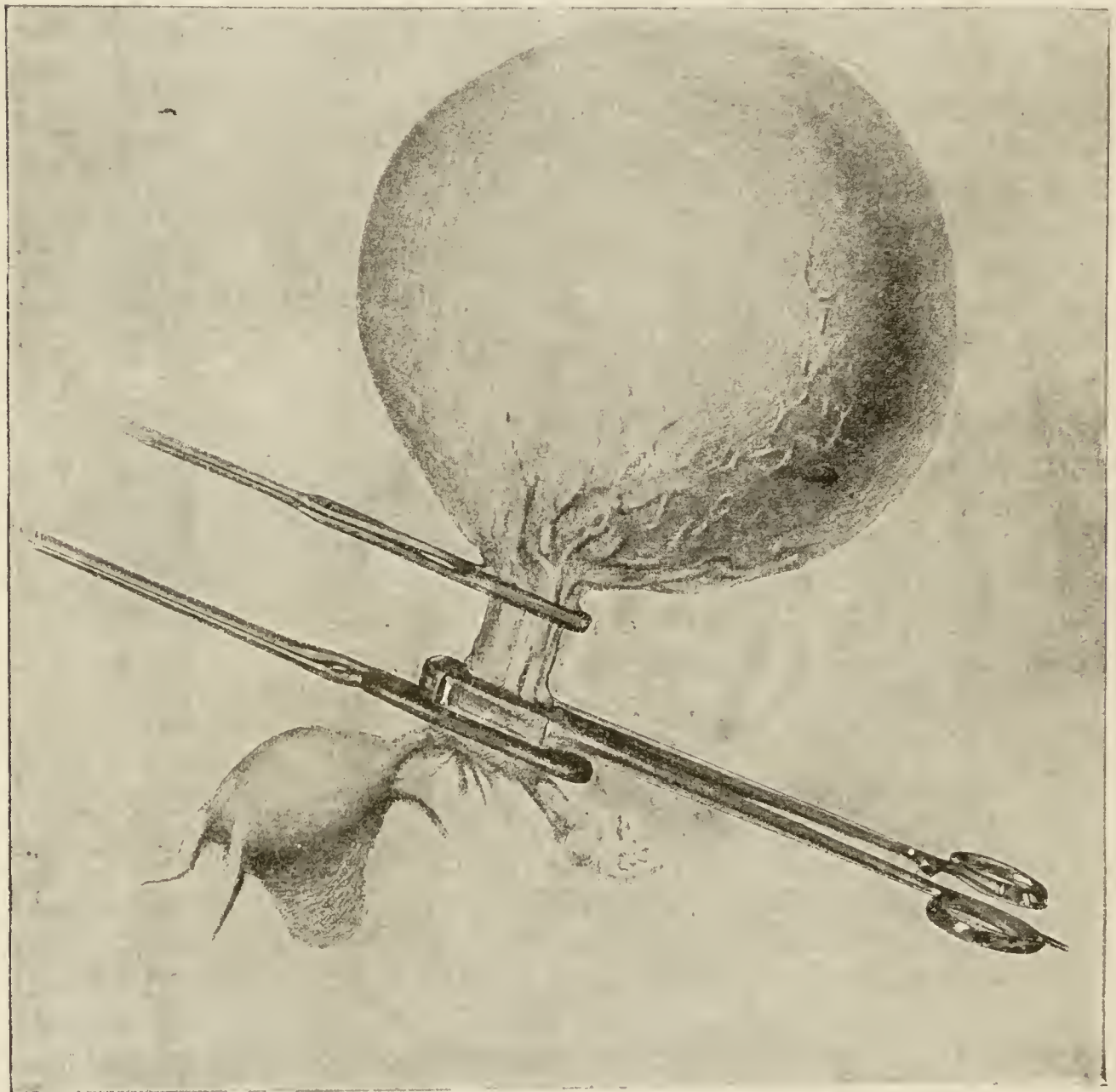


FIG. 355.—APPLIED TO OVARIAN CYSTOMA. (JACOBS.)

adhesions, these may be destroyed by a quick application of the forceps, and the bleeding of small vessels controlled. A special protective shield forceps is used by Skene and Downes, in the instance of intestinal adhesions, to protect the coils of intestine; or the same object may be effected with gauze. The applicability of this method to the pedicle of an ovarian cystoma is obvious. In abdominal total hysterectomy the ordinary hæmostatic forceps are quickly replaced by the electrical forceps, also the round ligament is secured. A minute and a half or two minutes is sufficient for the ovarian or uterine arteries, and one minute for the round ligament. The desiccated

pedicles are covered by the peritoneum by means of a catgut suture. In salpingo-oöphorectomy the same plan is pursued, the hæmostatic forceps being replaced by the electrical. In appendicectomy in unruptured cases the appendix and meso-appendix are included in one bite of the angiotribe, and then section is made, and the purse-string suture is applied in the cæcum at the base of the sterile stump, which is invaginate, and covered over by peritoneum. In other cases the meso-appendix is first hæmostased, especially when there

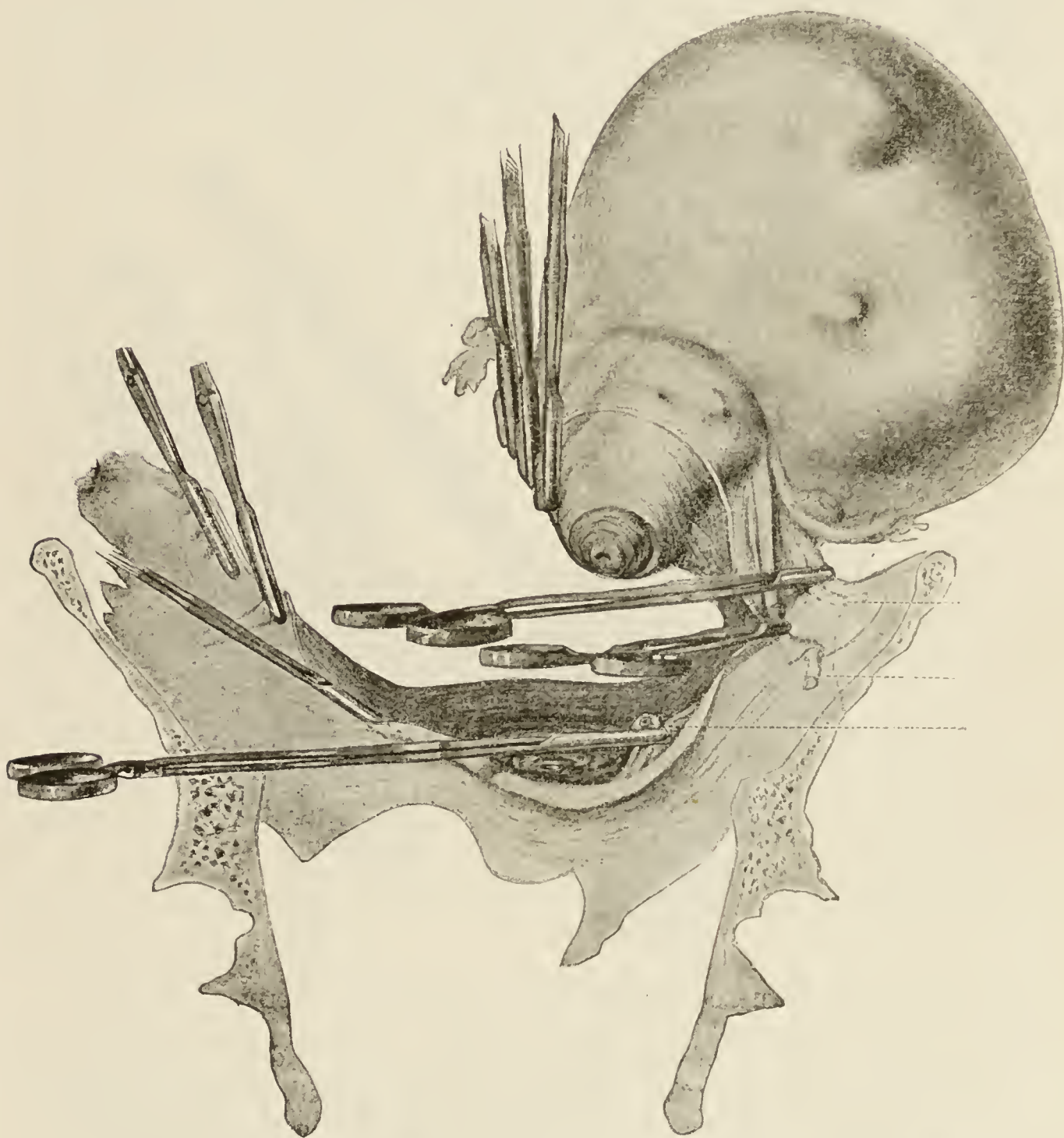


FIG. 356.—ELECTRO-HÆMOSTASIS IN PAN-HYSTERECTOMY. (JACOBS.)

has been rupture. The purse-string suture to invaginate the sterile stump is always a necessity.

Jacobs cites a case in which he resected a large portion of the omentum, and instead of ligaturing he used the electrical forceps, with perfect control of all hæmorrhage. He argues that, even if an operation be slightly prolonged beyond the time occupied by the simple ligatures, the delay is compensated for by the advantages offered by the method.

Downes records a case* in which a large tubo-ovarian suppurating mass was removed and four inches of the colon resected with end to end anastomosis. In appendicectomy, in a minute and a half to two minutes, the application of the forceps allows of section of the tissues on a level with the instrumental construction. There is no necessity to place sutures of any kind, nor to refold the pedicle of the appendix under the peritoneum. The intestinal mucous membrane is united, and the canal of the appendix is closed. There need be no apprehension in returning the cæcum into the abdomen. These advantages are claimed for the use of electro-hæmostasis over



FIG. 357.—ELECTRO-HÆMOSTASIS IN PAN-HYSTERECTOMY. (JACOBS.)

the ligature in removal of the appendix:—The organ is divided without the escape of its contents on the adjacent surfaces, also without risk of perforation or abscess of the wall of the cæcum from the invagination of an infected pedicle, and the extension of the infection into the pedicle between the ligature and the incised end.

In vaginal hysterectomy the forceps used are longer than those employed in abdominal hysterectomy, so as to enable the surgeon to obtain greater security. Further than the substitution of the electrical for the ordinary forceps, there is nothing exceptional in the operation.

* *American Gynæcology*, July, 1903.

CHAPTER XXVII.

UTERINE NEOPLASMS—MYOMA (continued)— SURGICAL TREATMENT.

Supra-vaginal Hysterectomy.

KELLY thus classifies the different methods of performing hysterectomy :—

(1) Ligature of ovarian and uterine arteries at opposite sides, with supra-vaginal amputation (Freund).

(2) Ligature of ovarian and uterine arteries of the same side, division of the cervix, ligature of the uterine and ovarian arteries at the opposite side (Pryor-Kelly).

(3) Exposure of the cervix posteriorly, and its complete division ; exposure and seizure of the uterine vessels, or the clamping of the broad ligaments at either side, with or without the ovaries, and removal of the uterus (Faure).

(4) (*a*) Anterior exposure of the cervix, which is divided ; the clamping of the uterine arteries ; further detachment of the uterus, and the clamping of the ovarian vessels ; or (*b*) the clamping of the broad ligaments at either side from the cornua to the uterine arteries, which are included, with subsequent removal of the tubes and ovaries (Kelly).

(5) Seizure and elevation of the uterus by its cornua, and its bisection into the cervix ; division of one half of the cervix, with exposure and control of the uterine arteries ; traction of one half of the uterus, with exposure and control of the ovarian vessels ; the same treatment of the other side of the uterus (Faure-Kelly-Krœnig).

Method of Dealing with Complications and Adhesions.—These include pelvic abscesses, vesical and rectal adhesions, and embedded or adherent adnexa.

In all these, primary bisection of the uterus is availed of, so as to secure easier access to the embedded or adherent adnexa. He attributes to the newer methods the following advantages : The

period of enucleation is shortened, the uterine arteries are more promptly secured, there is more room for dealing with adherent adnexa, the whole field of operation is more open to view, and greater precision and security is secured.

Supra-vaginal Hysterectomy.—The preliminary steps of the incision and delivery of the tumour are the same as those already described. This may also be said of the ligation of the ovarian vessels and the management of the adnexa.

Some operators do not remove the ovaries if they be healthy, with the object of preventing the disagreeable symptoms of the artificially produced menopause. This, however, will depend upon the condition of the ovaries. Many consider that it is sufficient to leave one ovary, and this is the practice I follow.

The tubo-ovarian vessels and the round ligament are tied separately. It is safer to place two ligatures, one nearer the uterus,

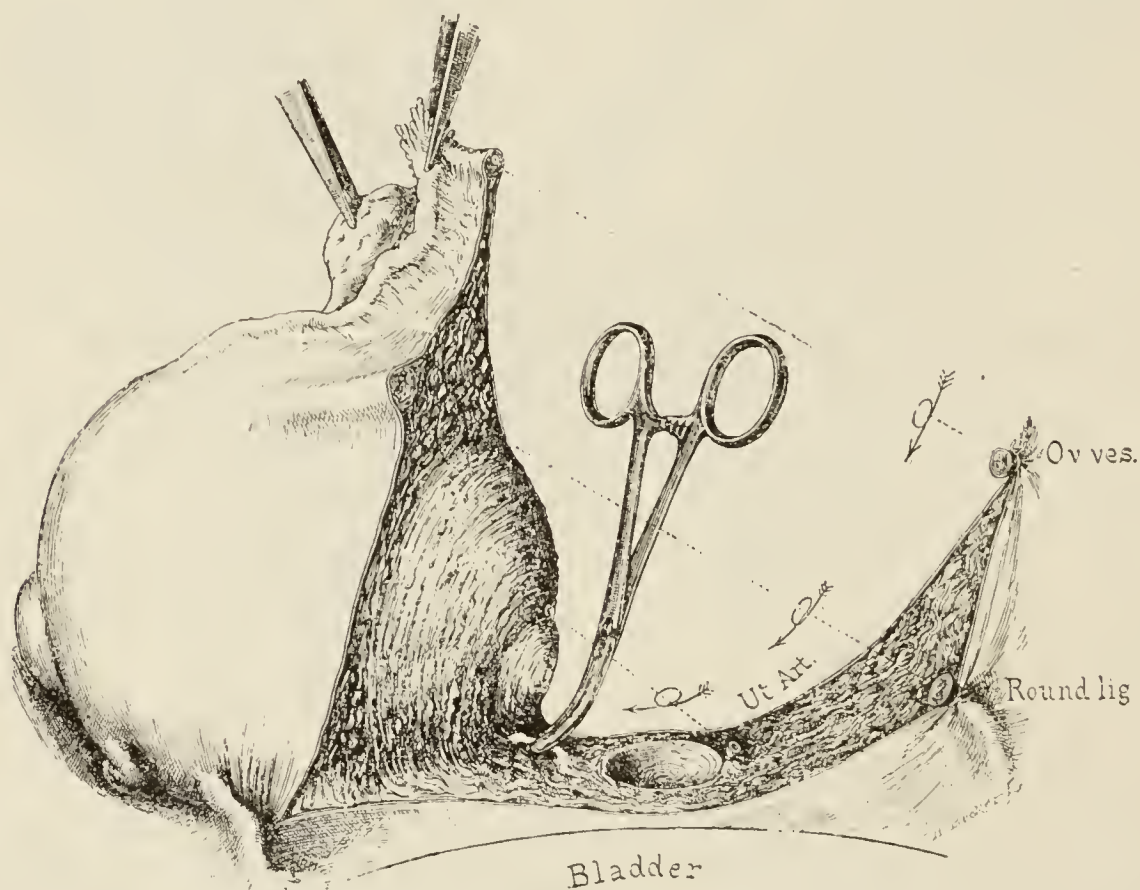


FIG. 358.—A CONTINUOUS INCISION FROM LEFT TO RIGHT, LIGATING OR CLAMPING, AT THE POINTS INDICATED BY THE ARROWS, THE LEFT OVARIAN VESSELS, THE ROUND LIGAMENT, THE LEFT UTERINE ARTERY. (HOWARD KELLY.)

After section of the cervix, the uterus being drawn to the right side, the right uterine vessels are exposed and secured.

and the other at the pelvic side, and divide the broad ligament between these. It is immaterial whether we use a sharp-curved needle, held with a convenient holder, or the blunt broad ligament needle. I prefer the latter for the broad ligaments. A short

curved needle is the best to secure the uterine artery with. It is well, however, always to have at hand various sizes of the sharp needles, as well as those of Olshausen. The vesico-uterine peritoneum is next detached. An incision is carried from one round ligament to the other, and the bladder, having been raised, is freed from its connection with the uterus by being pushed down, either with a gauze-dab or a piece of sponge held in the holder. The cervix is bared as far as the vaginal junction, and the uterine vessels at either side come into view. The uterine artery is now felt for at the left side, and, with a sharp curved needle passed close to the uterus, it is securely ligated, together with the veins.

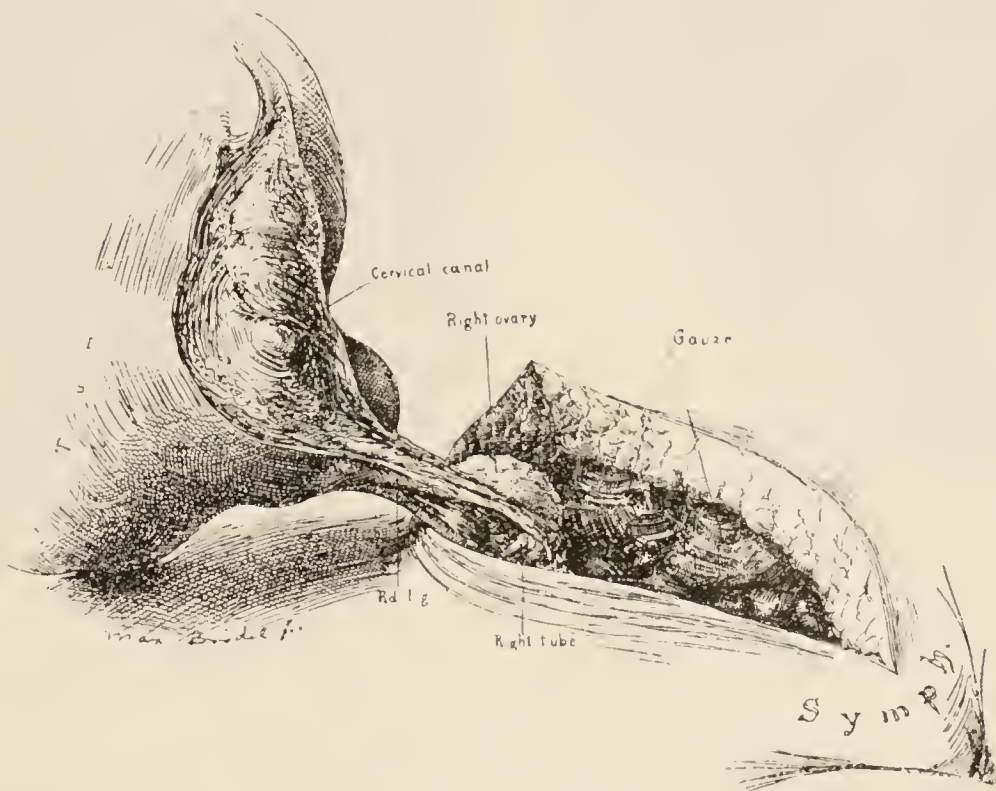


FIG. 359.—THE TUMOUR CONNECTED ONLY BY THE ROUND LIGAMENT AND RIGHT ADNEXA. (HOWARD KELLY.)

If there be any doubt as regards the security of the ligature, it is well to draw the vessel out from the uterus, and place a second ligature upon it. The broad ligament at this side can now be divided, the scissors being made to skirt the margin of the uterus, not necessarily enclosing any of its tissue. Any remaining vessels that bleed are caught and rapidly ligatured. The uterus is now held up by an assistant, and tilted over towards the right side. But little blood should have been lost up to this part of the operation. The cervix is now divided a little above its junction with the vagina, and in doing so the uterine canal is exposed. This is covered by some folds of sterilized gauze, and the severance of the uterus is completed up to the exposure of the opposite uterine

vessels, which are seen at the right border of the cervix, and a little distance from it. The uterus is now drawn up, so as to separate the cut surfaces, and thereby the vessels at the right side



FIG. 360.—SAGITTAL SECTION OF LARGE MYOMATOUS TUMOUR. (HOWARD KELLY.)*

The uterus in this case is at the bottom of the tumour, which extended to the pelvic floor. The tumour had undergone central necrosis and suppuration, opening through an antevertebral abscess into the transverse colon. There were extensive omental adhesions on the face of the tumour, which were freed by leaving a thin layer of the latter attached to them. Hæmostasis of the pelvic vessels was facilitated by an antro-posterior section of the cervix after previous clamping of the broad ligaments, and the transverse section was then completed. During the operation a litre of pus escaped from the abscess.



FIG. 361.—SAGITTAL SECTION OF A MYOMA TREATED BY MEDIAN BI-SECTION OF THE TUMOUR AND UTERUS. (HOWARD KELLY.)*

In this case the ovarian and uterine vessels were spread over the summit of the tumour, on which lay the fundus uteri. The growth was removed by bisection of the uterus and tumour, each half of the tumour being enucleated. When the uterine vessels were ligated, the halves of the uterus were also enucleated, and the bed of the tumour closed by buried sutures, the patient making an excellent recovery.

* *Amer. Jour. Obstet.*, Sept., 1900.

are more completely exposed. The uterine artery first, the round ligament secondly, and the ovarian vessels last, are each secured with Kocher's forceps, and when the broad ligament has been divided the tumour can be removed. The tubo-ovarian vessels and the round ligament are now tied, the uterine artery being dealt with last. After careful wiping of the peritoneal surfaces, and examination of the pelvic cavity, so as to secure any remaining vessels that may require ligature, the cervical stump is examined and dried, the canal is wiped out with a small roll of gauze wet with formalin solution, and, if there be reason to fear infection from the nature of any secretion it contains, a uterine wool-holder is dipped in carbolic acid, and carried a short distance into the canal. The surface of the cervical stump is now fashioned so as to permit of the anterior peritoneal flap being drawn forwards over the stump, and attached to the posterior peritoneum from side to side by continuous catgut suture. The ends of the round ligament and the ovarian pedicles are turned in between the peritoneal layers, and now the two layers of peritoneum are united together from side to side of the pelvis in a line running from one ovarian pedicle to the opposite. Nothing now remains but to complete the peritoneal toilet and close the abdominal wound.

Zweifel, in supra-vaginal hysterectomy, when feasible enucleates the tumour from its capsule, and, having done so, secures the round and broad ligaments either with his angiotribe or ligatures. In closure of the abdominal wound where the latter is large, he first passes three or four deep gut sutures through all the structures save the skin, using the needle as shown in Fig. 399. The ends of these sutures are allowed to hang at either side of the wound until the other suturing in layers is completed, and then they are tied up. In cases where the abdominal incision has to be considerably extended, or in which from emergency or urgency the triple suture cannot be carried out, three such sutures, applied at intervals, will be found to diminish considerably the tension on the other sutures.

Zweifel's Angiotribe.—Zweifel, in vaginal hysterectomy and pan-hysterectomy, as also in myomectomy, uses a powerful angiotribe, the nature of which can be readily understood from the illustration. It is used much in the same manner as Doyen's instrument, the crushing power of the blade being multiplied three times. Zweifel does not trust to it alone. He uses a Paquelin's cautery to the divided surface, and resorts to ligatures of chromicized cumol gut. He employs it both in vaginal and abdominal hysterectomy. In his vaginal operation he closes the peritoneum, and turns out the stumps in the same fashion as does Leopold.

Noble thus admirably described the method of dealing with that very commonly met with complication, viz. the opening up of one or both broad ligaments by the tumour: 'In such a case the method of Kelly or that of

Pryor can be adopted. The ligation is made in the usual way on the easy side. Then the ovarian vessels upon the involved side are secured. The relations

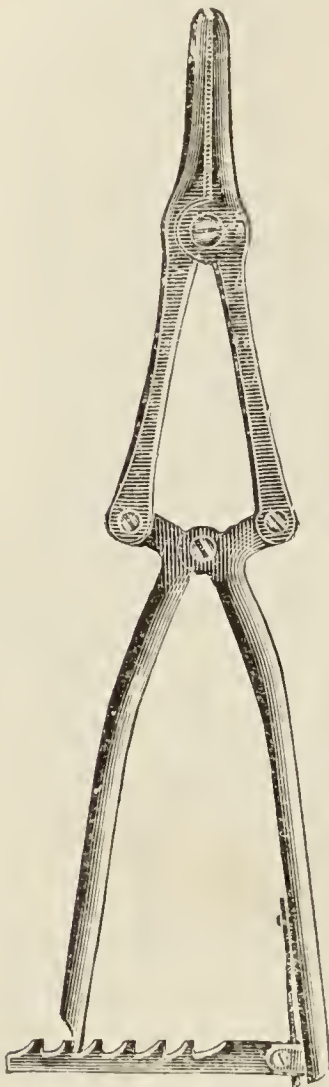


FIG. 362.—ZWEI-FEL'S ANGIOTRIPE.

of the upper border of the broad ligaments may be entirely distorted by the intra-ligamentous development of the tumour, but the vessels can be found and ligated without difficulty. When spread out over the tumour, they are best picked up (especially the veins) by passing a blunt aneurism needle under them. The round ligament may be widely separated from the ovarian vessels. A separate ligature is placed to secure the vessels of the round ligament. Clamps are placed to control reflux hæmorrhage. The round ligament is then cut through, and the peritoneum in front of the tumour is incised, and the incision is carried across the front of the uterus to the opposite side. The bladder is then pushed down, and the peritoneum is pushed off the anterior face of the tumour. Careful search is made for the ureter, as in such cases it may run over the anterior face of the tumour. (He has never found it in this location.) The ovarian vessels are next divided, and the peritoneum is incised on the posterior face of the tumour. The tumour is then enucleated by making traction upon it with the hand or with vulsellum forceps, and by pushing the peritoneum and connective tissue off from the tumour with a sponge. At this stage all vessels have been secured except the uterine artery upon one side, and if the tumour be peeled out of its bed by pushing the connective tissue away with a sponge, no hæmorrhage results. After enucleation and

delivery of the tumour, the uterine vessels upon the involved side can be ligated in the usual way.'

When both broad ligaments are distorted by intra-ligamentous development of the tumour or tumours, temporary ligatures are placed internal to the ovaries upon both sides to control hæmorrhage from the ovarian arteries. 'By placing clamps near the horns of the uterus to control reflux hæmorrhage, the upper border of the broad ligaments can be cut through, and the vessels of the round ligaments secured in the usual way, and the tumours enucleated by traction and pressure with a sponge as already described. After delivery of the tumours, ligation of the uterine vessels is simple. The cervix is then amputated and closed. Permanent ligatures are placed external to the ovaries, and the appendages are removed. Finally, the peritoneal flap is sutured in the usual manner. This method is especially valuable when the tumour is impacted in the pelvis, and the appendages are densely adherent beneath the tumour.'

Baer's Supra-vaginal Method.

In Baer's operation, by transfixion, ligation, and cutting, assisted by the control of clamp forceps, the broad ligaments are severed at both sides from

the tumour to a short distance from the cervix. The knife is then carried lightly around the tumour in front and behind, an inch or two above the

FIG. 363.—SHOWS THE OVARIAN, ROUND LIGAMENT, AND UTERINE ARTERIES LIGATED BY ISOLATED AND MASS LIGATURES. (NOBLE.)

The exposed surface of the cervical stump is seen cupped, and as yet uncovered by the peritoneal flaps.

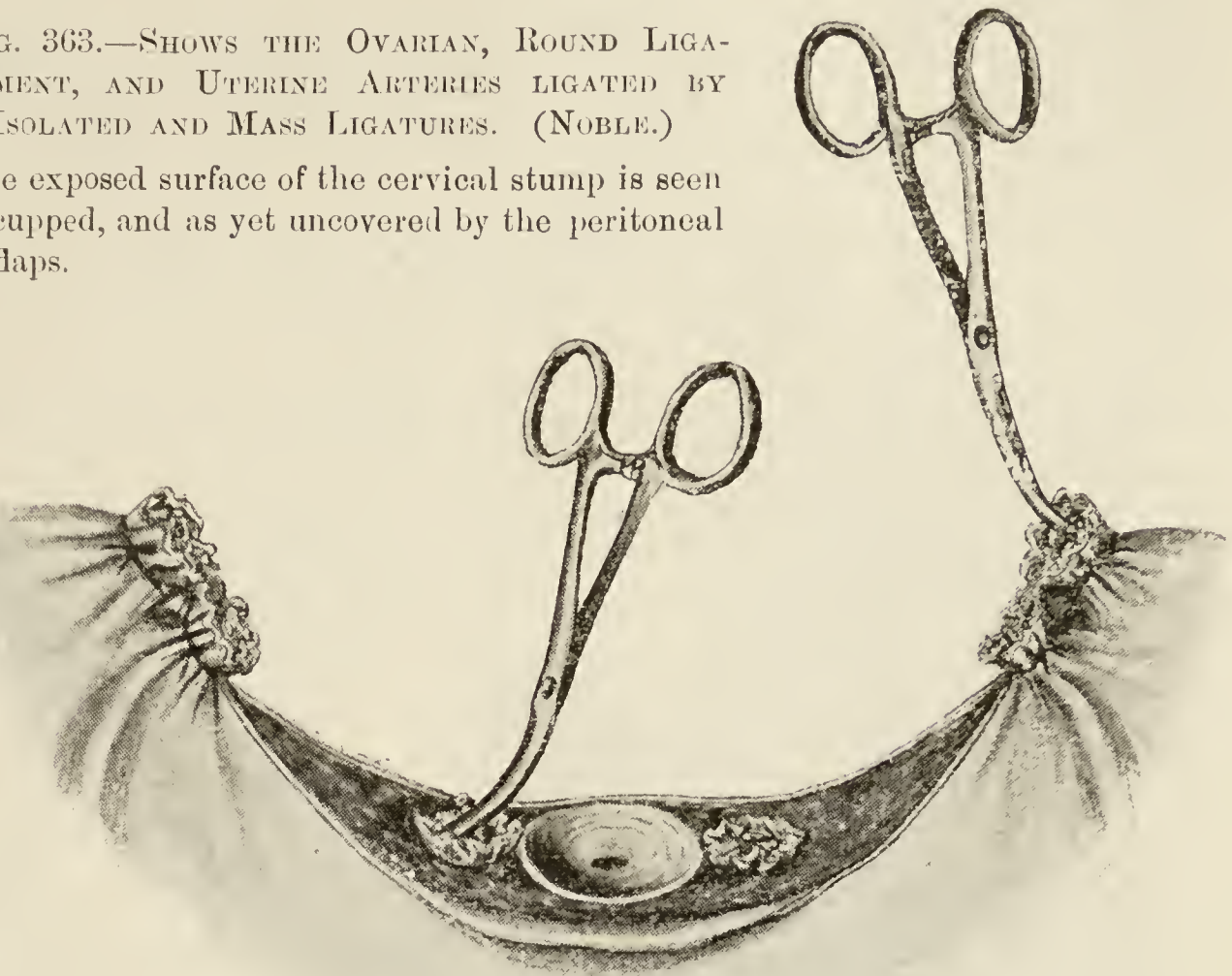


FIG. 364.—SHOWS THE ROUND LIGAMENT, OVARIAN, AND UTERINE ARTERIES LIGATED BY AN ISOLATED AND MASS LIGATURE. (NOBLE.)

The cervical stump is closed once by interrupted sutures; the peritoneal wound at the left side is closed by Lembert suture.

peritoneal reflexion of the bladder, and the peritoneum stripped off with a scalpel handle for the purpose of making peritoneal flaps. The next step is the ligation of the uterine arteries. This is accomplished by passing the ligature through the broad ligament, outside of, but close to, the cervix, avoiding the ureters. The uterus is then amputated, and the stump (trimmed and made as small as possible) immediately recedes upon being released, and is buried out of sight by the peritoneal flaps which cover it like elastic bands. The peritoneal flaps are united by Lembert sutures, if necessary. The cervix is thus allowed to resume its natural position, and is devoid of a single ligature or suture in its tissues. Nothing whatever is done to the cervical canal. Nor has Baer found it necessary to use the temporary elastic ligature about the cervix.

Complications met with in Supra-vaginal Hysterectomy.—Howard Kelly classifies these thus:—

Those due to adhesions to, and affections of, the surrounding structures; those brought about by changes in the tumours themselves; those due to the position of the myomatous mass; those due to pregnancy, ascites, and other causes in particular.

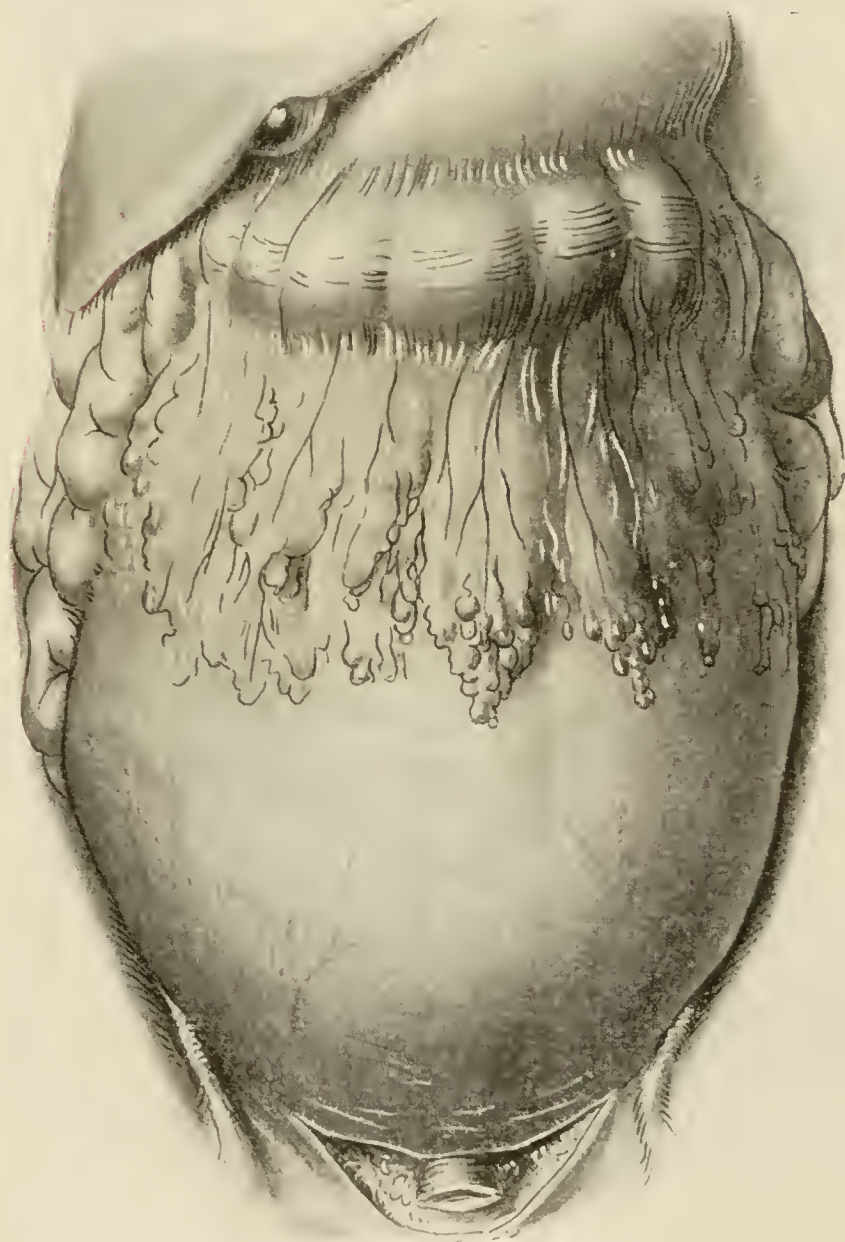


FIG. 365.—TUMOUR WITH OMENTAL ADHESIONS.
(HOWARD KELLY.)

The first class includes those affections of the ovaries and Fallopian tubes which are likely to cause adhesions of the omentum, parietes, rectum, sigmoid, colon, small intestines, vermiform appendix, liver, and suspensory ligament. It also includes diseased states of the ovaries, as well as diseases of the cervix and uterine mucosa, any of which may give rise to adhesion. As regards the changes in the tumours themselves, these include cysto-myoma, telangiectasis, suppurating myoma, and adeno-myoma. Amongst the principal complications due to the position of the tumour,

are high displacements of the tubes and ovaries, filling and wedging of the

pelvis, alteration in the position of the vesical and posterior pelvic peritoneum, broad ligament myoma, displacement of the ureters, and other unusual developments of the myomata in different directions. With regard to the third class, there is the myoma which complicates pregnancy, and those cardiac nephritic and ascitic conditions that complicate myoma. If there be an adherent sigmoid flexure with inflammatory and diseased conditions of the left tube and ovary, and the latter are difficult to reach, either because they are sheltered by the tumour, or wedged down in the pelvis, and the adhesions dangerous to separate, being out of sight, the enucleation is begun by seeking out the ovarian vessels at the outer extremity of the broad ligament, and tying at two points; then cutting between them, and tying off the round ligament in the same way. The top of the broad ligament is thus opened up, and the uterus can be lifted out so as to allow a free access to the inflamed structures. If pus be present, it must be carefully removed in the usual manner by protection of the parts and aspiration.

Omental, parietal, and intestinal adhesions have to be treated in the ordinary manner by careful detachment and ligation.

If the vermiform appendix be adherent, and the adhesion slight, it may be peeled off; but if dense, with evidence of past or co-existing appendicitis, Kelly cuts the tumour across the cervix, having freed it on the left side, clamps the right uterine artery, rolls the tumour out, and, having secured the right round ligament and ovarian vessels, clamps off the appendix near the colon, leaving it attached to the tumour, and subsequently dealing with its stump.

If there be tumours of the ovary complicating the myomata, these must be dealt with according to the individual peculiarities of the case, the ovarian tumour and fibroma being removed together.

Should cancer of the cervix be present, or malignant conditions, such as adenocarcinoma, of either the cervix or body, it is better to perform pan-hysterectomy.

If the tumour be fibro-cystic, and there be much fluid in the cyst, this may be tapped, and the operation then proceeded with.



FIG. 366. — NECROSED MASS, WHICH, WITH LIGATURES, WAS PASSED THROUGH THE OS UTERI AFTER SUPRA-VAGINAL HYSTERECTOMY ON THE TWENTY-FOURTH DAY, LEAVING THE VAGINAL VAULT PERFECT. (NATURAL SIZE.)

There had been an offensive vaginal discharge, but no constitutional symptoms whatever. The mass came away when the vagina was being douched at night. The patient made a perfect recovery. (Author.)

The More Serious Complications in Hysterectomy.

With regard to the serious complications the surgeon has to deal with in the removal of myomata, viz. unusual and dangerous developments, either with reference to the space occupied in the pelvis, or the relations of the tumours to the peritoneum and the pelvic viscera, the management of all such must depend upon the exact condition met with at the time. The lines of procedure in various cases will be influenced by (*a*) the difficulty in delivery of the tumour; (*b*) the freeing of adhesions; (*c*) the position of the bladder with regard to the tumour; (*d*) the involvement and displacement or division of the broad ligaments and the adnexa; (*e*) the pelvic attachments, and the firmness of adhesions and degree of impaction of the mass; (*f*) the displacement of the ureters, or the presence of adhesions which either surround them or bring them into close relation to the uterine arteries or branches of these vessels; (*g*) the relation of the tumour to the sigmoid or rectum, and the presence of adhesions uniting the tumour to the bowel.

Post-Operative Hæmatemesis.—In speaking of post-operative hæmatemesis, Halliday Croom * says: 'In a number of cases where hæmatemesis occurred which I have taken from my note-book, I find that eight out of ten died, and that the hæmatemesis continued from the end of the first forty-eight hours till death ensued. From my own cases I should be inclined to agree with the writer of a recent paper, who states that age has no influence on the incidence.

'Many theories have been advanced. One is that it results from the administration of an anæsthetic, but considering the frequency with which anæsthetics are given and the comparative rarity of hæmatemesis, I think we may put this out of court. Again, it has been said that it is due to handling the stomach and duodenum, but in most of the cases occurring in my own experience the stomach and duodenum have not been interfered with. The theory of Von Eiselsberg is that it is due to thrombosis of the omental vessels after ligature or injury, followed by embolism in the wall of the stomach and the formation of ulcers.

'So far as my personal experience is concerned, I am disposed to think that most cases of hæmatemesis after abdominal operation are due to sepsis. Sepsis, we know, could produce congestion and small hæmorrhages in the mucous membrane, and whether sepsis be the actual cause or not, in my experience at least, the phenomenon was usually observed in cases which did ultimately succumb to sepsis in some form or other.

'Whatever the cause, I have no hesitation in saying that, in abdominal sections at least, hæmatemesis is one of the most serious complications which can occur.' †

* *Brit. Gyn. Jour.*, May, 1902.

† In the *British Gynecological Journal* of 1902, a case of coffee-ground vomiting with hæmatemesis after hysterectomy, in a patient, aged 41, is recorded by me. There were no evidences of sepsis either in pulse, temperature, or respirations, until on the fourth day the coffee-ground vomiting occurred. The abdomen was opened, but nothing was found to account for the bleeding. It continued notwithstanding every means used to arrest it.

CHAPTER XXVIII.

UTERINE NEOPLASMS—MYOMA—SURGICAL TREATMENT (continued).

Vaginal Hysterectomy by Ligature and Angiotripsy.

Vaginal Hysterectomy by Ligature.—Looking at the exceptions which have been enumerated in regard to the indications for vaginal hysterectomy, it is not, speaking generally, prudent to attempt to remove myomata by the vaginal route save in a relatively small proportion of cases. This conclusion is the more true since the value of the operations of myomectomy, with or without morcellation, has come to be realized. The two most complete operations for small interstitial and subperitoneal myomata are those of enucleation, either by colpotomy, posterior or anterior, or abdominal cœliotomy. In the case of obese women, where vaginal hysterectomy is feasible, the removal of the tumour by this route is preferable. Also, in tumours of a given size in which unilateral adnexal cysts, solid tumours of the ovary, or simple tubal distensions complicate the growth, the vaginal method may be selected. The adnexal cyst tumour, or dilated tube, is first dealt with, and then the uterus is removed with comparative ease.

Operation.—In proceeding to perform vaginal hysterectomy for myoma, when hæmostasis by ligature is the method to be followed, it is well also to have at hand some various-sized clamp forceps or pressure forceps, for temporary hæmostasis, or, should some insuperable difficulty arise in controlling hæmorrhage, it may be necessary to resort to forcipressure by the clamp, which is allowed to remain.

Every aseptic precaution having been taken, and the vagina thoroughly sterilized, the woman is placed in the usual position, the buttocks being brought well over the edge of the table, and the thighs widely apart. The operator sits in front of the patient; an assistant stands at either side, and another, or a nurse, takes

control of the instruments, ligatures, and sutures, while a second nurse has charge of the dabs, etc.

Should leg rests not be at hand, nor a hysterectomy table, the assistant at either side supports the thighs by slipping one arm

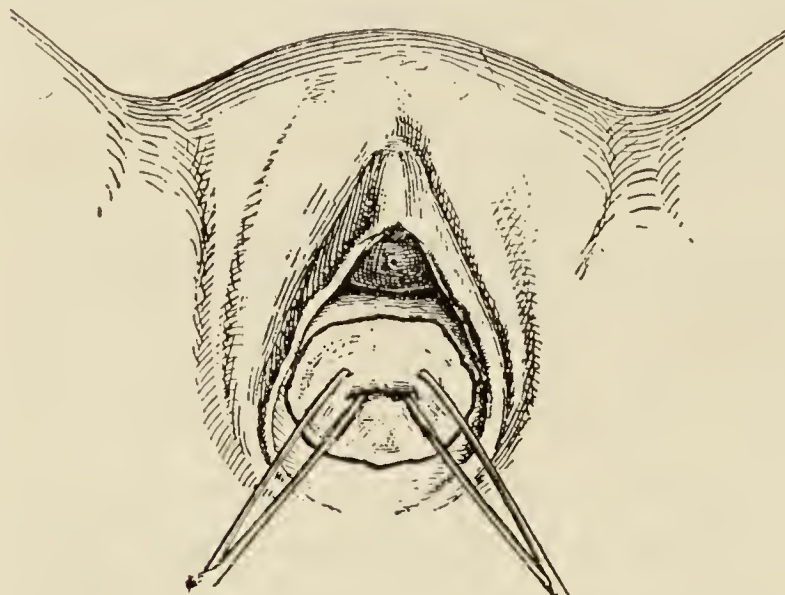
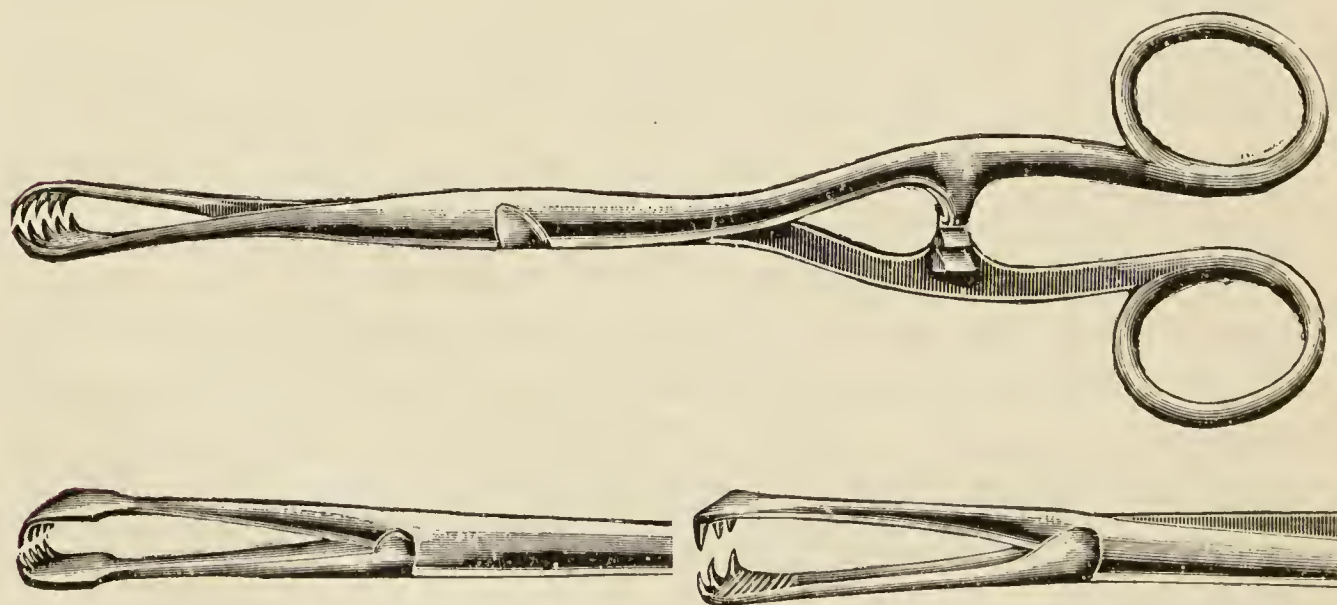


FIG. 367.—PRELIMINARY INCISION ROUND CERVIX.

under the knee of the patient, holding it up and out, leaving his other hand free to assist with dabs or instruments. With a full-sized Martin's retractor, the posterior wall of the vagina and the perineum are drawn well back, and so held by an assistant. The empty bladder is ex-

explored with the sound, and its relation to the uterus and vaginal cul-de-sac determined. The flushing retractor (Fig. 105) is most useful for the anterior cul-de-sac. It enables a constant stream of sterilized water, to which some lysoform is added, to be directed over the parts. The assistants keep control of the outlet at either side by means of lateral retractors. The cervical lips at either side are now seized with single tenacula, both of



FIGS. 368, 369, 370.—CLAW FORCEPS.

which are grasped in one hand. The uterus is drawn down as far as possible, and a circular incision is made round the cervix a short distance below the vaginal fold. The mucous membrane is now carefully raised and pushed away with the index finger. When

this has been effected the posterior fold of peritoneum is sought for, and is caught with the forceps and opened with scissors. The opening is enlarged by diverging the blades of the scissors, and with the finger. The tenacula being firmly held in the left hand, the right forefinger nail is now introduced underneath the anterior mucous fold, and this is stripped



FIG. 371.—O'SULLIVAN'S UTERINE TRACTOR.

thoroughly from the uterus, thus at the same time detaching the bladder, having again determined its relation to the uterus with the sound. The conical retractor of Martin is now passed anteriorly under the mucous membrane,

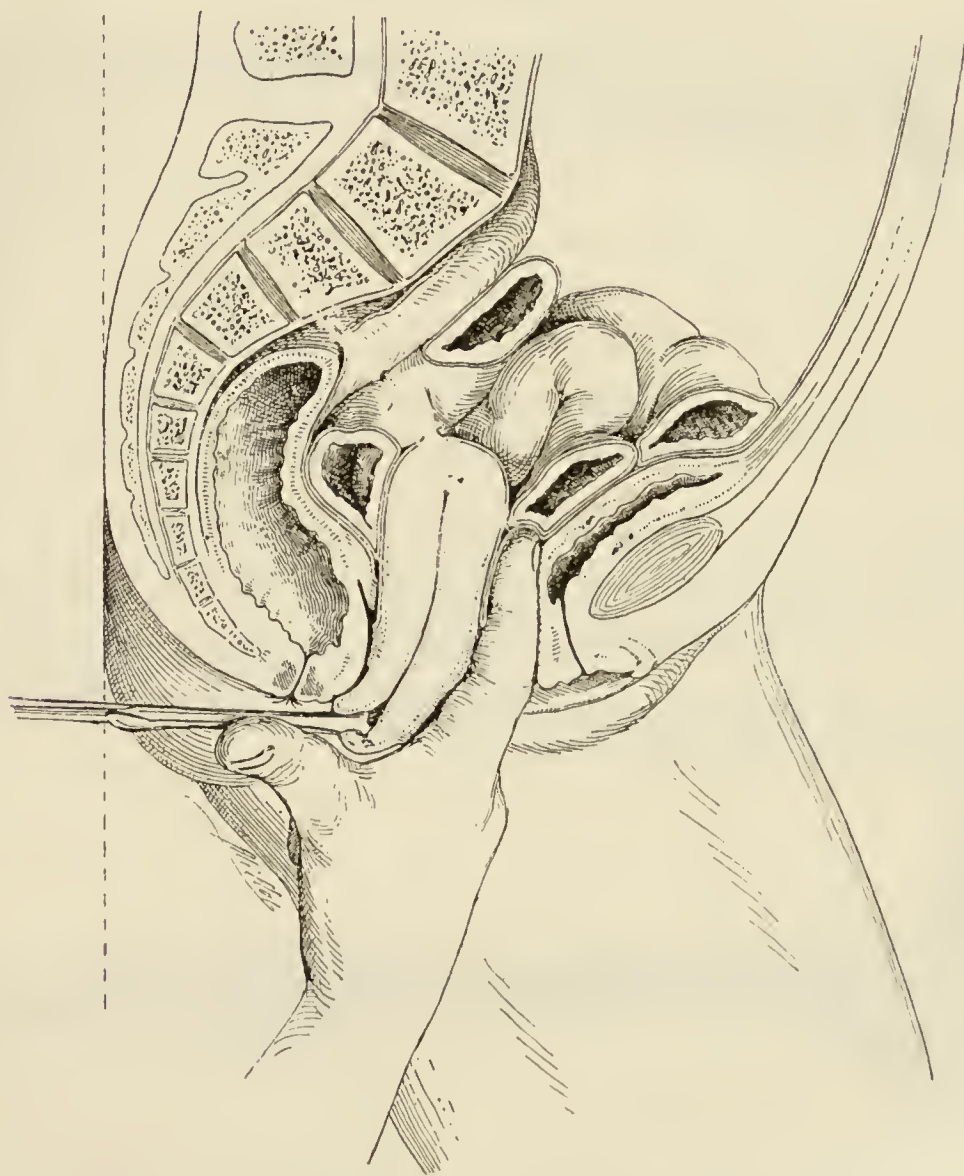


FIG. 372.—DETACHMENT OF THE BLADDER BY THE FINGER AFTER THE OPENING OF THE ANTERIOR CUL-DE-SAC. (DOYEN.)

and the peritoneal reflexion in front is carefully sought for. With a dressing-forceps and blunt-pointed curved scissors, this will be found with but little difficulty. When it is drawn down and

opened with the scissors, the opening being enlarged by diverging the blades, it is further freed by running the point of the forefinger from side to side of the aperture. The anterior peritoneal

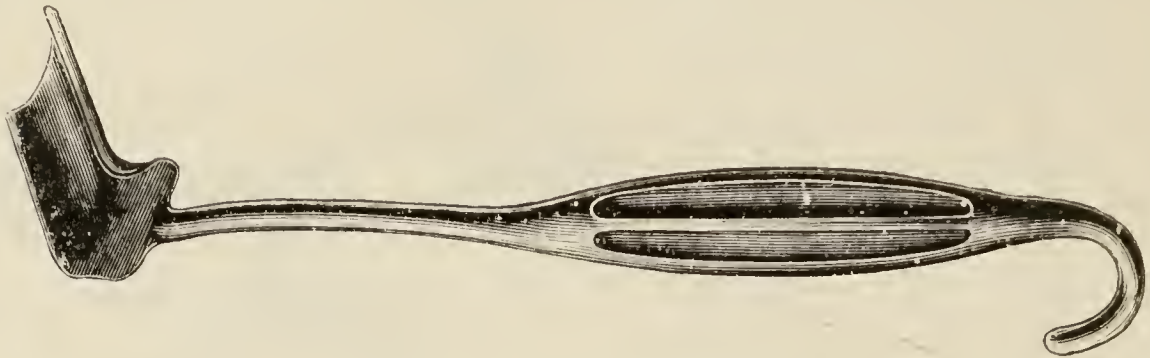


FIG. 373.—MARTIN'S RETRACTOR.

edge is now sutured to the border of the vaginal mucous membrane, by a continuous or interrupted gut or silk suture. The uterus is

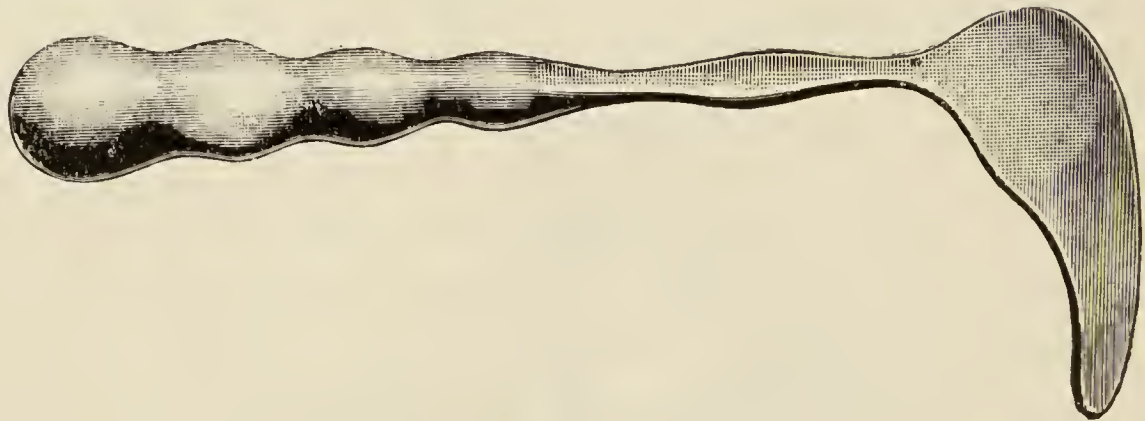


FIG. 374.—LARGE RETRACTOR OF MARTIN, TO PROTECT THE BLADDER.

drawn to the right side, and a finger is passed by the side of the cervix as far as the lower border of the broad ligament. The

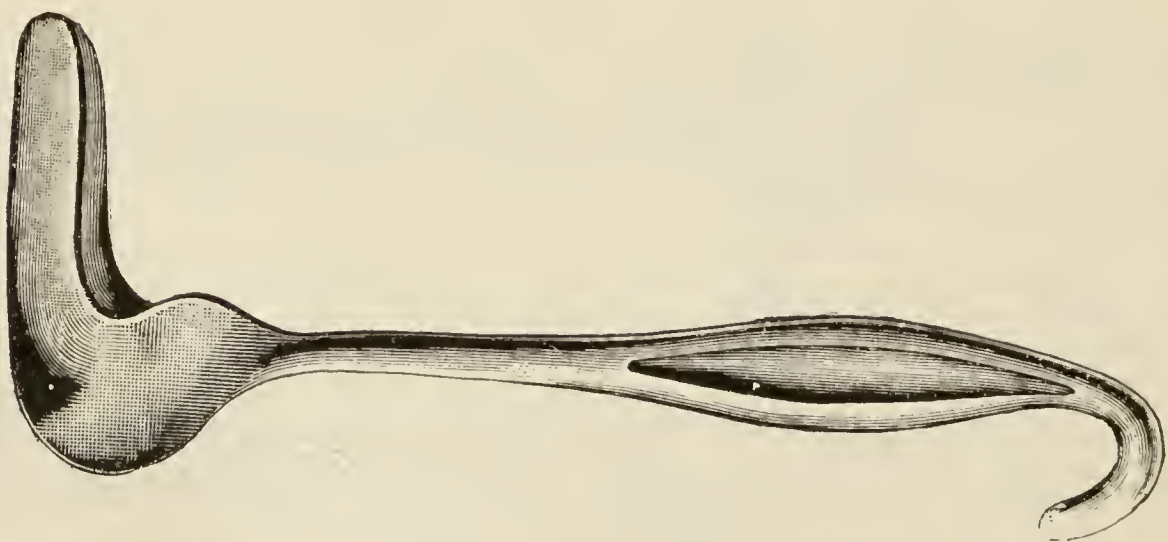


FIG. 375.—MARTIN'S LARGE PERINEAL RETRACTOR.

Both the above retractors are useful also in colpotomy.

pulsating uterine artery is now felt for, and a curved Olshausen's needle (Fig. 329) is carried close to the cervix, and the artery is ligatured. If the uterus be high, and any difficulty be experienced

in securing the ligature, the tightener of Ehrenfest (Fig. 387) may be used to secure it. The threads of the ligature are passed into the grooves at the extremity of the instrument, and are brought down and fixed in the slot, which is easily opened by slight pressure with the fingers. By compressing the handles the blades diverge, and thus the first loop of the knot is tightened. The instrument is withdrawn, and the knot is completed.

There is, however, very little difficulty as a rule in securing the



FIG. 376.—LATERAL RETRACTOR.

uterine vessel, the important point being not to pass the needle too far from the side of the cervix, in order to avoid including the ureter. A scissors, curved on the flat, with fairly broad blades, is now passed close to the uterine wall, and the ligament is detached by cutting close into, or even including, a portion of the uterine tissue. Another ligature is now passed in the same way above the first, and further section of the ligament is completed. A third ligature is

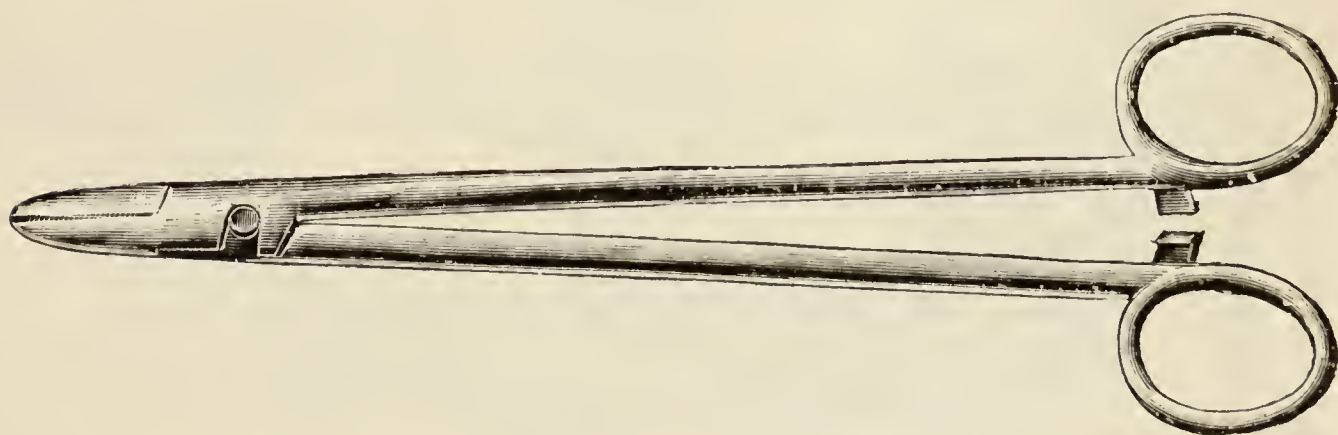


FIG. 377.—OLSHAUSEN'S NEEDLE-HOLDER. ($\frac{1}{2}$ SIZE.)

This is an admirable needle-holder—it is light, of sufficient length to catch sutures or ligaments deep in the pelvis, and easily manipulated.

generally required for further detachment of the broad ligament. We have now arrived near its upper border, around which the finger is hooked, drawing into view the tube and ovary of that side. If these be healthy they may be left, at least at one side. The upper portion of the ligament is firmly secured before its division, sufficient pedicle being left to provide against the slipping of the ligature. If, on the other hand, the adnexa be removed, these

must be drawn well down, and the ligature passed between these and the pelvic wall. The broad ligament having now been completely severed, the uterus is hooked forward by the volsella or the finger, and the broad ligament of the opposite side is ligatured in like manner to its fellow from above down ; or the same proceeding

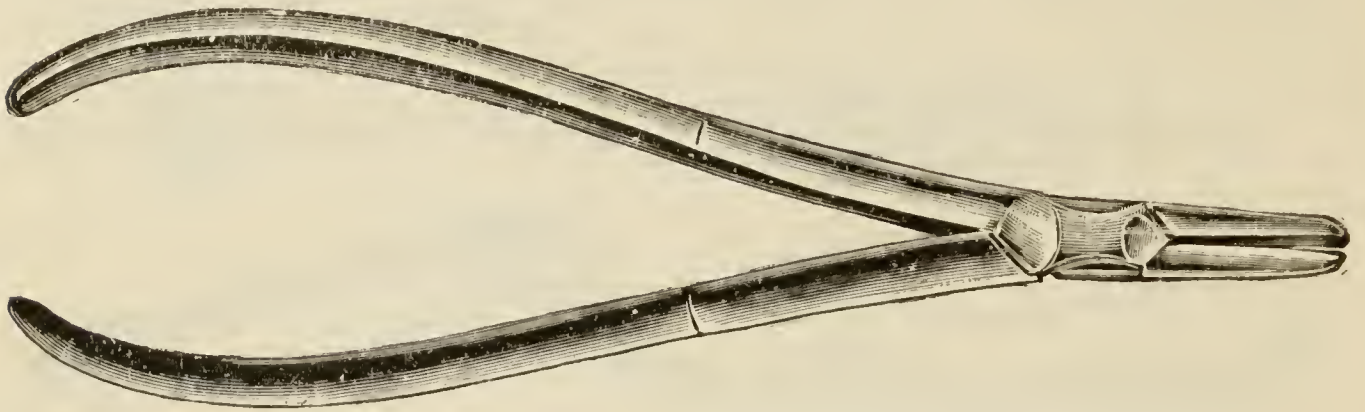


FIG. 378.—MARTIN'S NEEDLE-HOLDER.

An excellent needle-holder in vaginal operations.

may be adopted as before, and the uterine arteries secured first. The uterus is now completely detached, and we proceed to examine all bleeding points, and to secure these finally with ligature, not ceasing as long as there is any escape of blood, no matter how slight. Should some high-placed vessel resist our efforts, and there be still

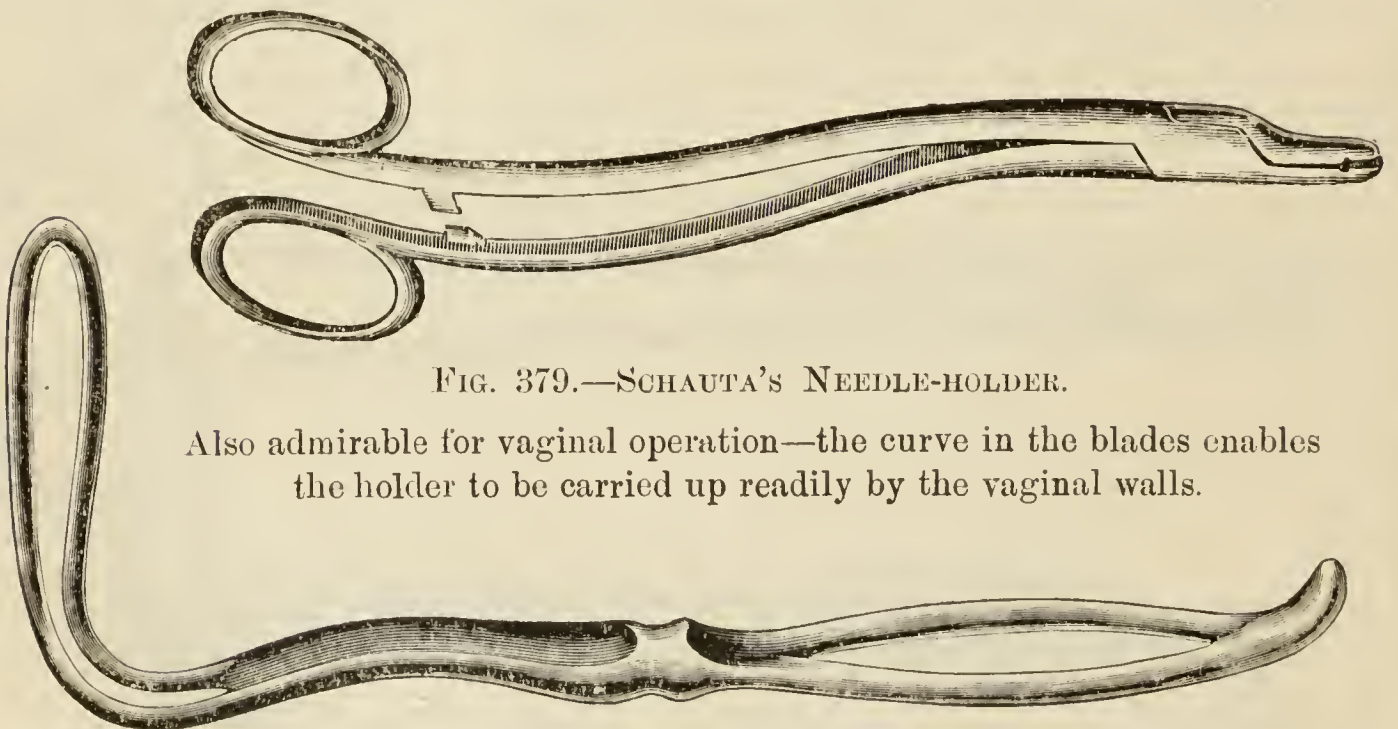


FIG. 379.—SCHAUTA'S NEEDLE-HOLDER.

Also admirable for vaginal operation—the curve in the blades enables the holder to be carried up readily by the vaginal walls.

FIG. 380.—FENESTRATED RETRACTOR.

trickling or oozing, it is better to resort to forcipressure rather than take the chance of post-operative hæmorrhage. Any protruding loop of intestine or omentum is cautiously pushed back, and the severed tissues and peritoneum are carefully but gently dried with sterilized gauze, and a final examination is made for any bleeding

point. Should a ligature seem to be dangerously loose, or a pedicle cut too close, it is better to re-secure it. In short, remembering that the principal dangers of vaginal hysterectomy are inclusion of, or injury to, the ureter, and hæmorrhage from insecure ligation of an artery, or loose tying of a pedicle, it is obvious that too



FIG. 381.—OLSHAUSEN'S RETRACTOR.
($\frac{1}{2}$ NAT. SIZE.)

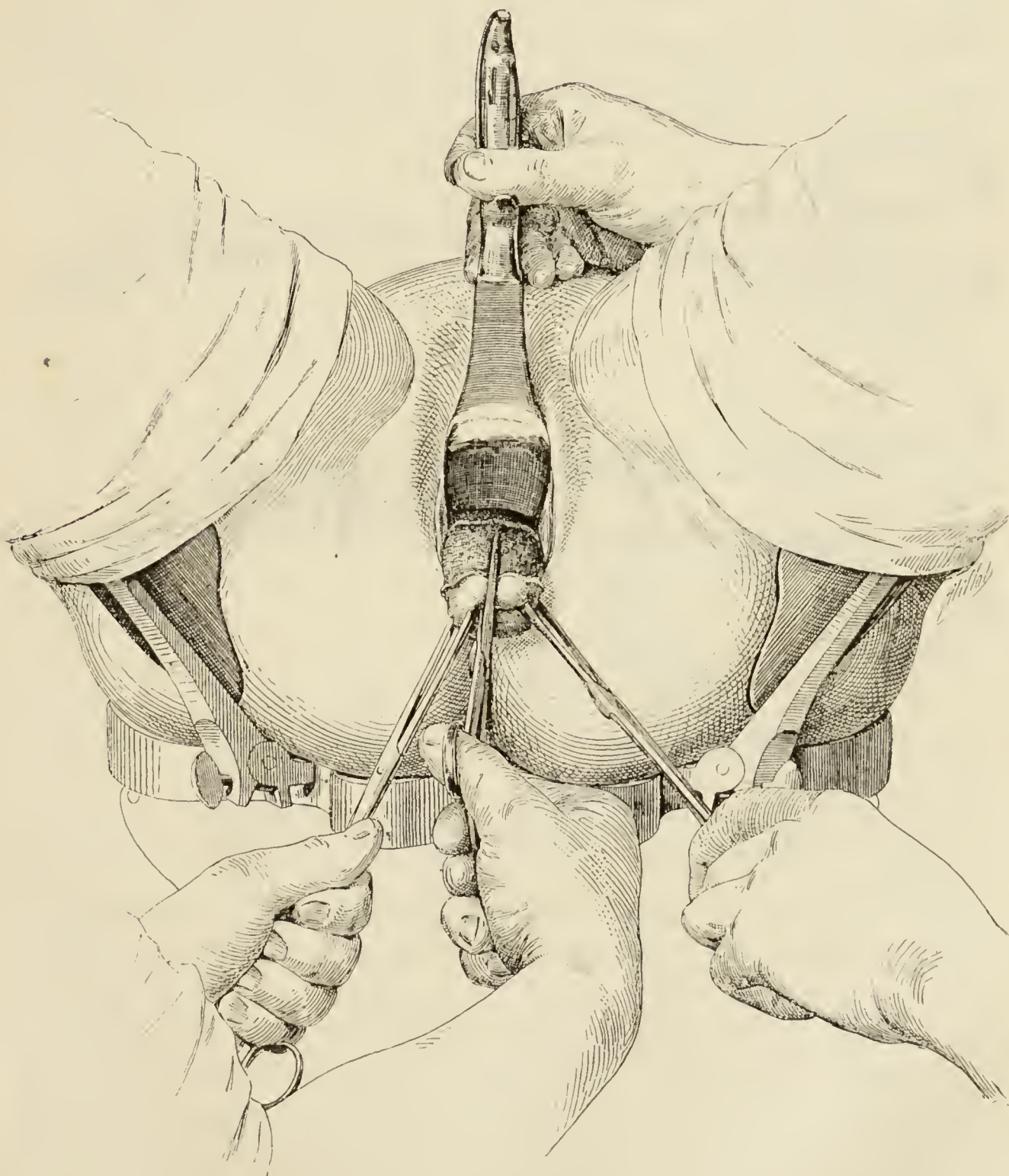
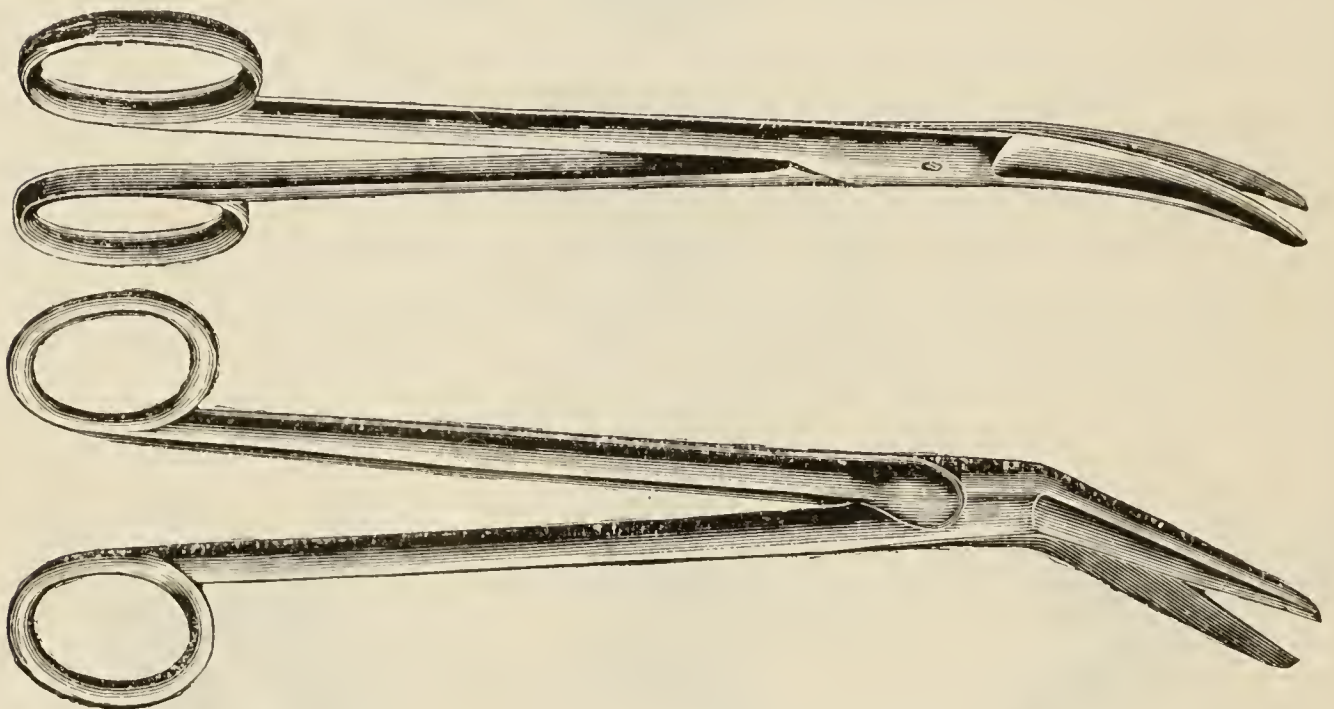


FIG. 382.—DIVISION OF THE ANTERIOR WALL OF THE UTERUS AFTER THE OPENING OF THE ANTERIOR CUL-DE-SAC. (DOYEN.)

great care cannot be taken so as to avoid the former or to protect our patient against the latter.

The ligatures at either side are now tied together, but are left sufficiently long to be readily removed; a strip of iodoform gauze, two inches in breadth, and some sixteen inches in length, is passed between them so as to fill loosely the space between the broad ligaments. The end of this is tied, and turned up over the pubes, and another tampon of sterilized gauze supports this, and is also tied, the knots on both strings indicating the respective tampons. The gauze pack must not be too loose in the vagina. Some operators, in the majority of cases in which drainage is not required, unite the peritoneum across, or at either side. Kelly unites it in the centre, leaving an aperture at either side. The last



FIGS. 383, 384.—USEFUL BLUNT-POINTED BROAD LIGAMENT SCISSORS.

step is the passage of the catheter so as to relieve the bladder and afford proof that it is uninjured.

This description of vaginal hysterectomy is to be taken as specially applicable to the operation for myoma or other tumours in which the peri-uterine structures are not involved, and where there are not diseased states and tumours of the adnexa, or complications arising out of adhesions. When these are present, the operation must necessarily vary according to the conditions which are met with as it proceeds. The size of the tumour, the difficulty of reaching the vessels, of bringing down the adnexa, of severing or detaching adhesions, of controlling unexpected and obstinate bleeding, and, in the case of any suspicious malignancy, of going sufficiently wide of the uterus to remove infected tissues and glands, may each and all

compel the surgeon to alter his plan of operation. Thus the time occupied will vary from twenty minutes to over an hour, or even longer, according to the presence or absence of complications. The internal strip of gauze is not removed for eight days.

The operation is greatly facilitated in many cases by the bi-section of the uterus, especially in cases in which there are adhesions and adnexal complications. Or the size of the uterus may be reduced, as has already been shown, by the exsection of triangular portions taken from its wall, grasping the fundus higher and higher at each side with claw forceps. In this manner its bulk is reduced, and we have obtained room to attack the appendages. In some cases Kelly divides the uterus into quadrants further to facilitate the operation.*

Vaginal Pan-Hysterectomy performed by Pryor.—This operation like Kelly's, is specially adapted for cases of small myoma complicated with pelvic inflammation.

The patient is placed in the lithotomy position, her legs being held flex by a crutch on a table capable of being lowered to the Trendelenburg position. Two semi-circular incisions, leaving a small margin of vaginal mucous membrane, are carried, preferably with stout scissors, posteriorly and anteriorly so as to surround the cervix. The posterior cul-de-sac is opened, and the pelvic contents examined. Any obstacles that may be found in opening the cul-de-sac are overcome by the finger and



FIG. 385.—PATIENT'S POSITION IN PRYOR'S VAGINAL PAN-HYSTERECTOMY. (PRYOR.)

freer opening of the peritoneum. An ectopic gestation or a retro-peritoneal fibroma may so dissect or lift the peritoneum as to make examination through the posterior pouch impossible. It must then be made through the anterior cul-de-sac, and it may be necessary to remove any myomatous nodule that may prevent the exploration. The bladder is next separated from the uterus, any difficulties being overcome in the usual manner, as in anterior colpotomy. The anterior and posterior incisions are made

* See Cancer of the Uterus for Kelly's operation by quadrisection.

to spread laterally by means of the finger, so that the rents in the peritoneum are of equal size with the incision in the vagina. Hemisection of the uterus is now performed, the anterior wall being divided to the uterine cornua by a median incision. The tip of the index finger, passed up behind the uterus, projects at the angle of the division above, and a retracting groove director is passed until it projects in the same position. Over this grooved director the posterior wall of the uterus is severed with a special bistoury, which has its cutting edge along its convexity. The operator now deals with either half of the bisected uterus, the left half is usually first pulled out of the vulva, the higher adhesions are manipulated, and that half of the uterus with the released adnexa is returned into the pelvis. The right half of the

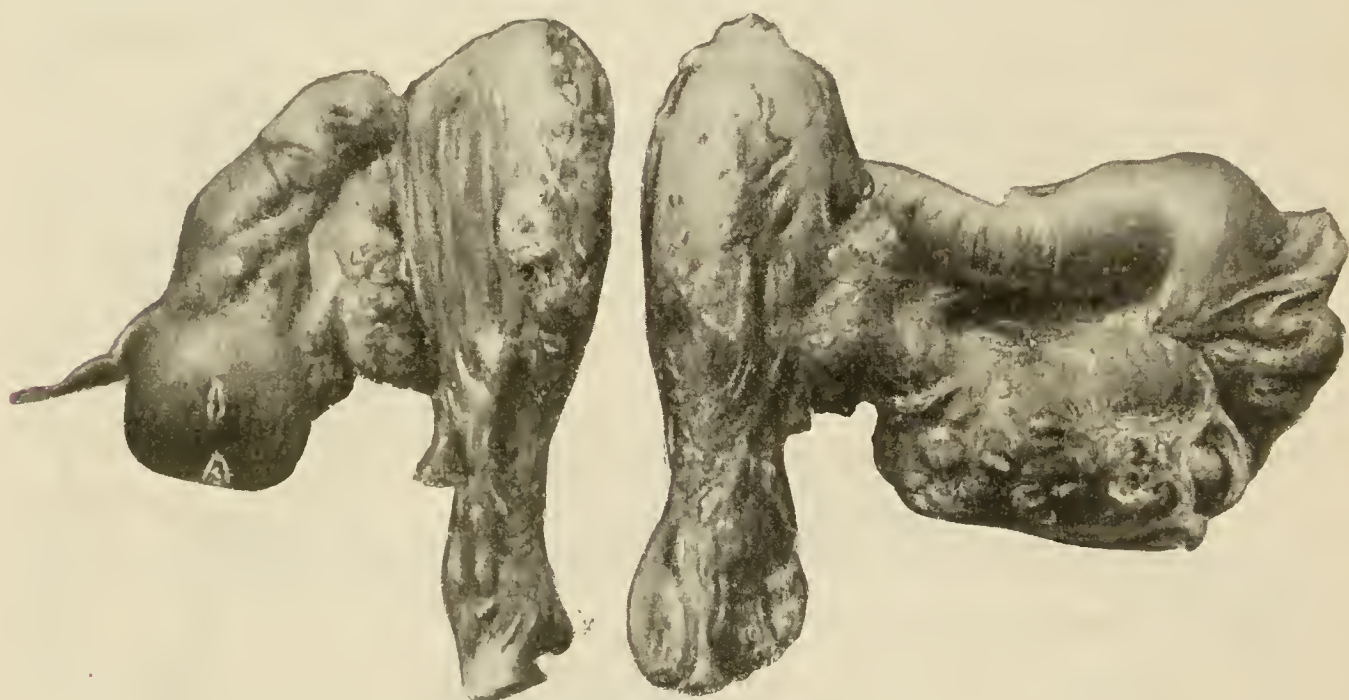


FIG. 386.—UTERUS AND ADNEXA REMOVED BY PRYOR'S VAGINAL PAN-HYSTERECTOMY. (PRYOR.)

uterus, with the adherent adnexa, is liberated in the same manner. Bleeding is arrested during the traction on either half. Very rarely, says Pryor, is a quarter of an hour needed to release and remove the tissues under a complete hæmostasis, the bleeding being parenchymatous only. A forceps having been applied to the ovarian artery, one half of the uterus is pulled out of the vagina and the adnexa brought forward. No retractors are necessary, the forefinger on one side of the broad ligament, and the middle finger upon the other, while the thumb powerfully doubles the uterus and holds the adnexa, converting the entire mass into a pedunculated one; the forceps is applied from above downwards, including the top of the broad ligament and the round ligament. The forceps has detachable handles, which are removed. The

tissues are cut to its ends, and another forceps is applied, so as to include the uterine artery, and its handles are removed. This half of the uterus and the adnexa is cut away, and the other half treated in a similar way. By means of retractors, anterior, posterior, and lateral, the forceps and the stumps are held back. Gauze pads are used to take up blood and discharges, the stumps are carefully inspected, and the dressings are now applied. The gauze pads are removed, and the forceps with the stumps are drawn into the vagina, and held in this position, while a piece of iodoform gauze is adjusted between the forceps and vaginal wall, and held firmly in this position by means of a retractor, this being done at both sides. Strips of iodoform gauze are now introduced between the forceps, so as to exert bilateral pressure on the latter. Nowhere is a forceps allowed to touch a soft part. A self-retaining catheter is introduced, and the sphincter ani dilated, so as to lessen spasm. The forceps is removed in forty-eight hours, and the bladder washed out after the catheter is removed.

In 1899 the author saw Schauta several times perform practically the same operation, save that in the place of the clamp forceps he used ligatures,

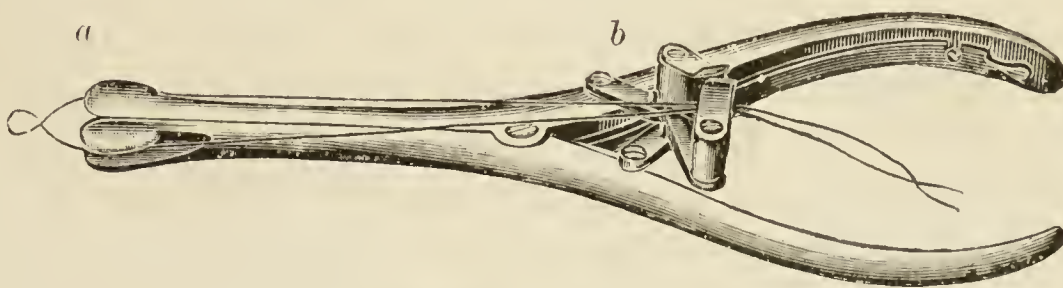


FIG. 387.—EHRENFEST'S LIGATURE TIGHTENER.

When the first loop of the knot is tightened over the vessel, the ends of the ligature are brought over the grooves at the end of the instrument (*a*), and fixed in the holder (*b*) by a catch. The blades are pushed home to the bleeding point, and by pressure on the handles are diverged, and the ligature thus made tense. A moment's delay secures the tightness of this loop of the ligature. Its ends are now released, and the second and third knots are made.

attacking each side separately. He employs Ehrenfest's ligature tightener in all cases in which there is any difficulty in reaching the vessel (Fig. 387).

After-management of Case.—The same treatment is adopted as after laparotomy. The patient is placed on her back, the bladder relieved at regular intervals, and nourishment administered much as in the instance of the abdominal operation, though here we may resort earlier to soft solid foods and nourishing liquids. The bowels are moved at the latest on the third day, preferably by an

emollient enema of salad oil and thin strained gruel. Should this not act, the patient may have a few grains of calomel followed by a saline purgative. When the internal strip of gauze is removed, the vagina is still kept loosely packed with a fresh tampon of the iodoform gauze or chinosol. I generally now use moist chinosol gauze after the first pack of iodoform, thus avoiding any toxic effects that might follow from the latter. Should there have been a prolonged operation, and shock be threatened or present, a litre of artificial serum should be injected.*

Hæmorrhage.—Secondary hæmorrhage, attended by collapse, is the most alarming of the after consequences of vaginal hysterectomy. Should it occur, as may be suspected from the signs already enumerated, no time must be lost in the endeavour to control it. The patient must be raised on to the table. An anæsthetic is administered, and the necessary retractors, hæmostatic forceps, dabs, and sponges, with the dressings placed ready at hand. Immediately the patient is under the anæsthetic, the packs are removed from the vagina, retractors are placed in position, and a good light, if it be at night, thrown on to the pelvis. By gentle traction on the ligatures the broad ligaments may be brought into view, and the loose loop of ligature seen: the bleeding point is immediately clamped. Otherwise, the ligament at the side from which the bleeding comes must be drawn down with forceps, the bleeding point sought for, and a pair of forcipressure forceps made to include the bleeding area, and left on. Under any circumstances, should the bleeding persist, there must be no delay or temporizing, but the bleeding tissues should be boldly clamped at either side. These forceps should remain from thirty-six to forty-eight hours.

Injury to Ureters.—In the chapter on ureteral surgery, reference is made to the management of divided or injured ureters.

The Combined Operation.—In certain cases, either from difficulties arising in dealing with the adnexa, or from the size of the tumour, and the presence of multiple or pedunculated myomata, it may be necessary to complete the operation by abdominal cœliotomy. Here, after the preliminary steps of the operation have been taken by the vagina (opening of the anterior cul-de-sac and posterior, separation of the bladder, ligature of the uterine arteries, and freeing the cervix), an antiseptic tampon is introduced into it, the hands are thoroughly sterilized, and the patient is placed in the Trendelenburg position. The abdomen is now opened, and the remainder of the operation is

* See pages 536, 537.

performed as in pan-hysterectomy, by the abdominal route. Such a procedure is to be avoided when possible, as submitting the woman to a considerable prolongation of the operation, and the additional risk involved in opening the peritoneal cavity from the abdomen, but such a step is better than to persist in endeavouring, through too narrow an aperture, to deliver a large and probably adherent mass, or matted and adherent pyo-cystic adnexa, which with the uterus resist delivery even after morcellation.*

The steps of Doyen's vaginal hysterectomy by angiotripsy are as follows :—

Having incised the posterior fornix, he opens the pouch of Douglas, and explores the pelvic cavity. The anterior fornix is next incised, and the bladder detached, the broad ligaments at either side are now secured by his pince, which is applied for about half a minute.

After a compression of from forty to sixty seconds the inferior third of the broad ligament may be cut or torn in the first stage of vaginal hysterectomy

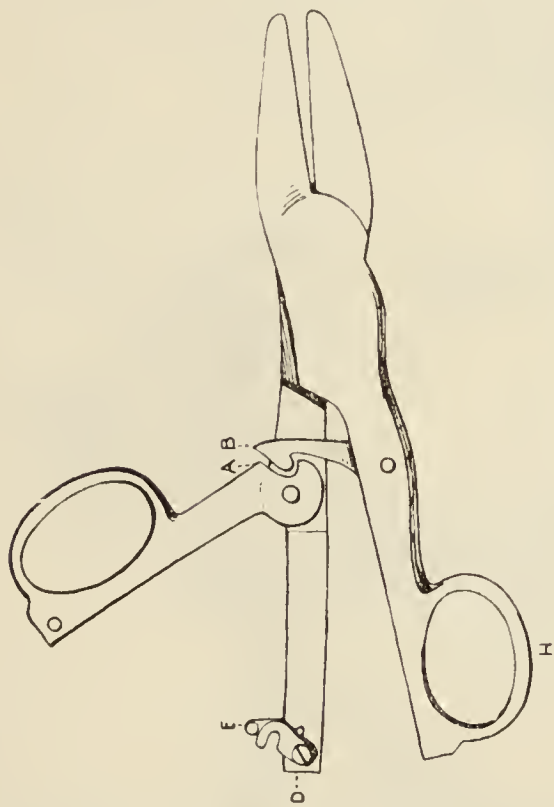


FIG. 388.—DOYEN'S LEVER PINCE.

With lever raised to exert pressure.

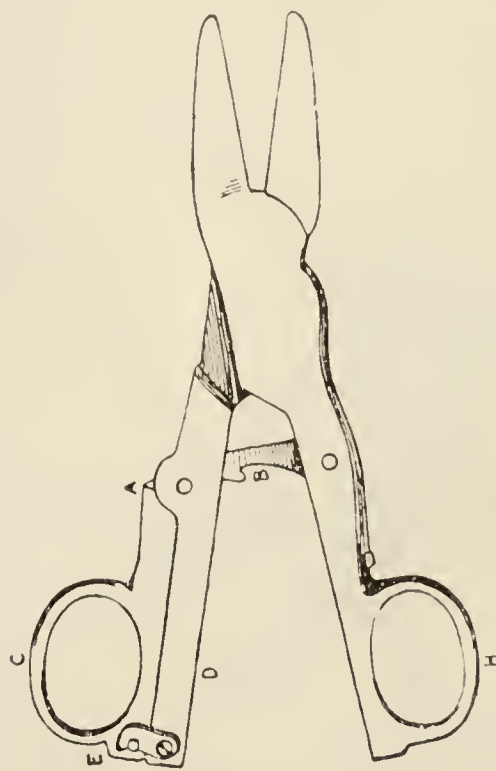


FIG. 389.—OPEN AS FORCEPS.

A pressure exerted with both hands equal to about 100 kilogrammes secures at the end of the forceps 2000 kilogrammes, and 1200 in the middle portion.

without any escape of blood. Towards the close of the operation the instrument is applied above the adnexa. Doyen thinks it imprudent, however, to cut the pedicle without placing a ligature or a small clamp

* Stanmore Bishop, *Brit. Gyn. Jour.*, Feb., 1899.

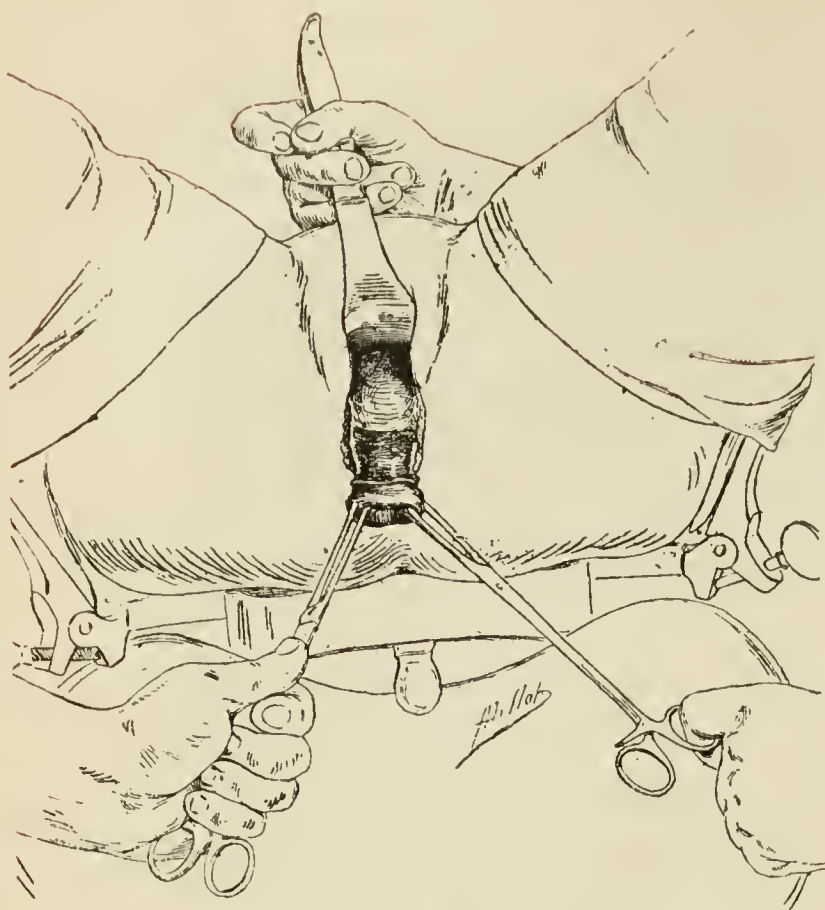


FIG. 390.—UTERUS DRAWN DOWN—ANTERIOR CUL-DE-SAC OPENED. (DOYEN.)

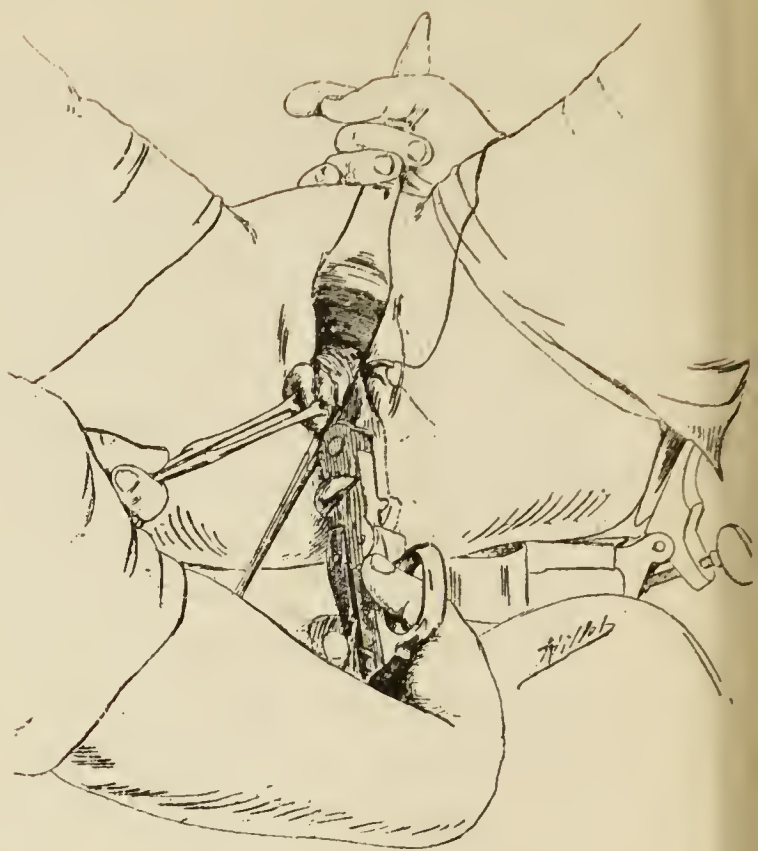


FIG. 391.—PRESSURE FORCEPS APPLIED TO THE LEFT BROAD LIGAMENT AND UTERINE ARTERIES FROM BELOW. (DOYEN.)

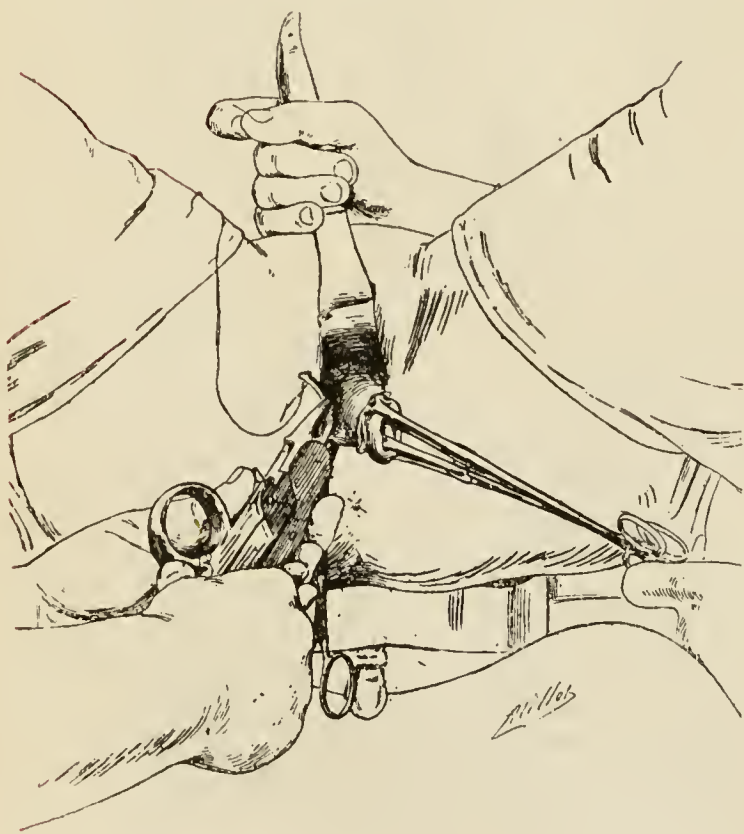


FIG. 392.—PRESSURE FORCEPS APPLIED TO THE RIGHT BROAD LIGAMENT AND UTERINE ARTERIES FROM BELOW. (DOYEN.)

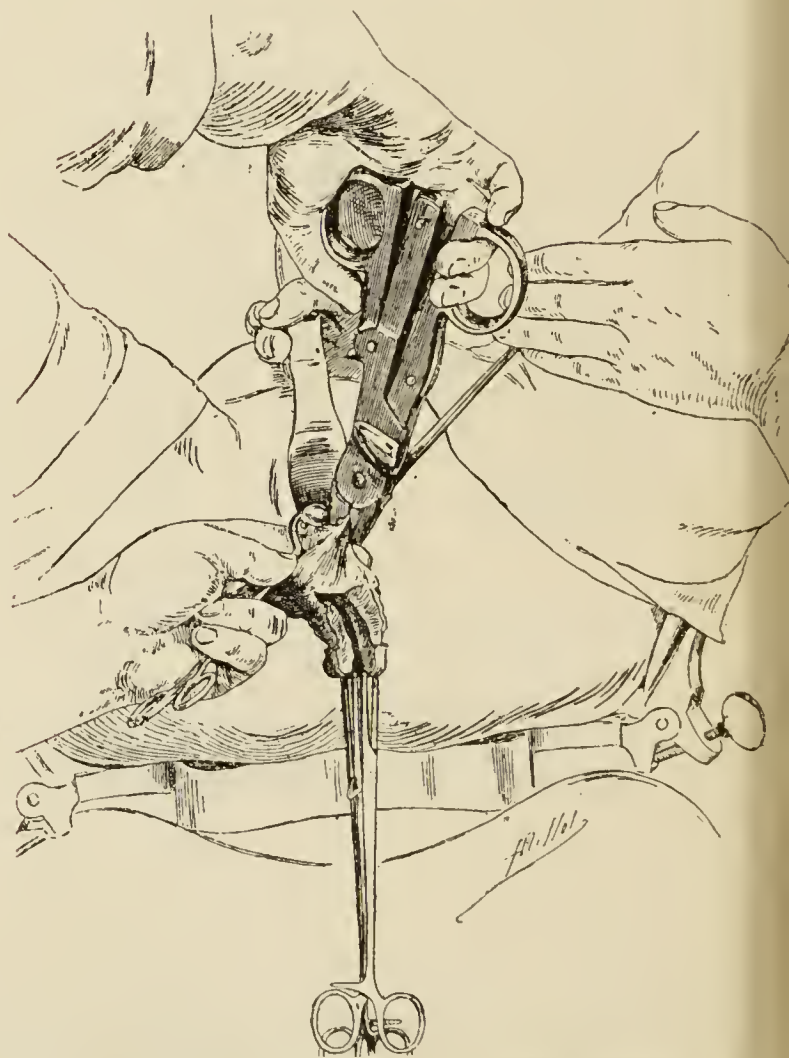


FIG. 393.—PRESSURE TO UPPER PART OF LEFT BROAD LIGAMENT AND OVARIAN VESSELS FROM ABOVE. (DOYEN.)

forceps on it, as the peritoneal rent reascends into the pelvic cavity very high when the uterus has been detached.

The uterus, having been drawn down, is divided in two by a median or V-shaped incision, the latter being that of selection for a large tumour. This allows of the delivery of the fundus and the adnexa; the angiotribe is now applied to each

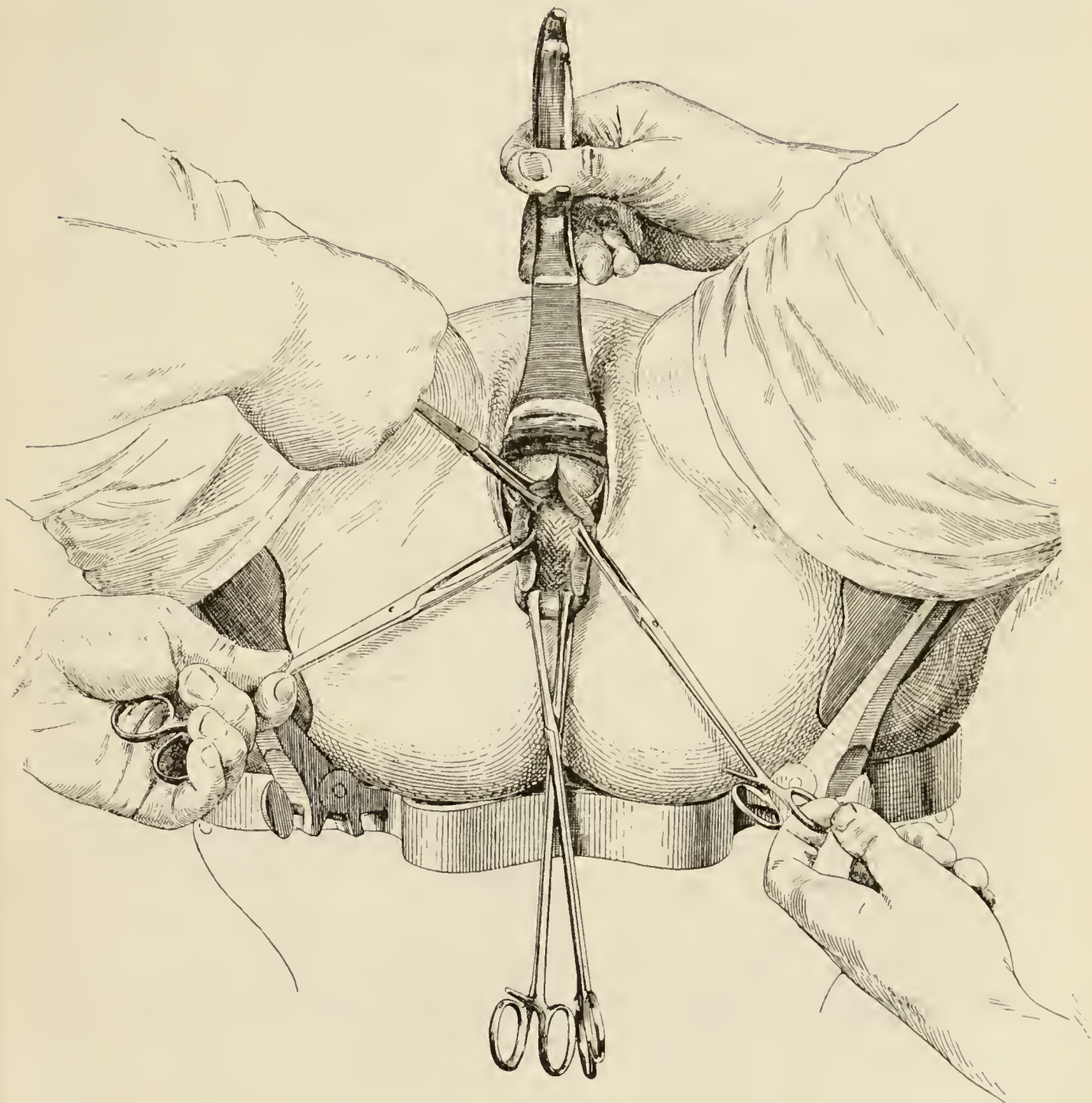


FIG. 394.—DRAWING DOWN THE UTERUS AFTER THE SECTION HAS BEEN COMPLETED—EXPOSURE OF FUNDUS. (DOYEN.)

broad ligament, and the complete separation of the uterus is effected. The upper border of the broad ligament is then finally crushed. A silk thread is tied in the groove formed by the angiotribe, and, when it is removed, the ligature is gradually tightened so as to embrace

the entire broad ligament. The peritoneal flaps are now brought carefully together, and the vagina is tamponed.*

Doyen's Clamp Operation.—Doyen's operation, as performed with his clamps, may be thus briefly described. The first step of the operation is the same as for posterior colpotomy, the posterior vaginal cul-de-sac being incised from right to left, and the posterior vaginal wall well depressed. The divergent blades of the scissors are used to open the peritoneum. Through the aperture thus made the fingers are introduced, and the uterus and adnexa examined. This enables the surgeon to make the final decision as to the advisability of removing the uterus. The incision of the anterior vaginal cul-de-sac is next made after the circular incision of the neck has been completed. The bladder is avoided by cutting with the blunt point of a curved scissors towards the uterus, and, with the finger turned with the nail to the uterus, the mucous membrane is raised and the bladder is detached and got well out of the way. This detachment is often facilitated by working, with a small sponge or roll of gauze held in a sponge forceps, towards the uterine surface, the pressure being directed away from the bladder. The peritoneal fold is quickly exposed, caught with a forceps, and opened with the same scissors. By diverging the blades the orifice is enlarged, and now a triangular-shaped retractor is slipped between the peritoneum and the body of the uterus. With tenacula the uterus is successively caught in stages from below upwards, until the fundus is seized and turned over to the vulva. Should this manœuvre be impossible, either through the narrowness of the outlet, or the size of the uterus, the organ is divided in the middle line as far as the fundus, and drawn downwards by the tenacula, fixed at either side of the lips of the incision. The uterus having been thus turned out, the adnexa are next brought down with the aid of an ovarian clamp forceps at either side. Doyen's clamps, large (Fig. 395) and small (Fig. 397), are now applied on the broad ligaments from above down at either side, and the ligaments are cut between the clamps and the uterus. Should any vessel bleed, it is caught temporarily in a forceps. A ligature may be applied to any small bleeding artery. Doyen's experience, up to the commencement of

* Doyen still uses clamps in his vaginal pan-hysterectomy in the more difficult cases, more especially in obese women with a narrow vagina, but in all other cases he resorts to the angiotribe and ligatures. There is no modification of his vaginal pan-hysterectomy as performed in the manner described in the text. He also uses the same angiotribe.

1898, led him to prefer, in vaginal hysterectomy, forcipressure to ligature, though, as he says, it was from no prejudice that he pre-



FIG. 395.—DOYEN'S LARGE CLAMP FORCEPS.

ferred the former, as for a long time he used the ligature, and still employs it under certain indications. He applied the ligature when

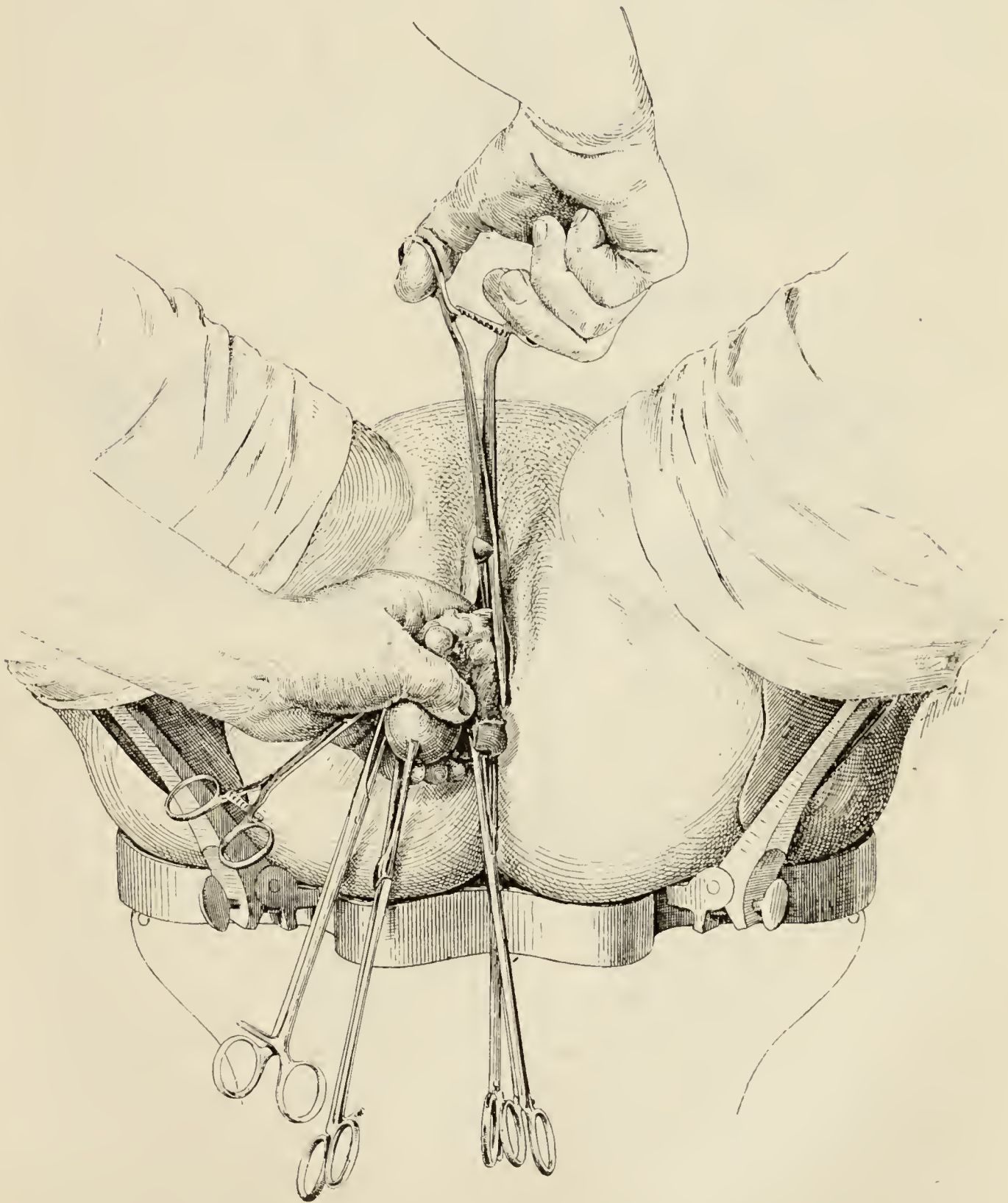


FIG. 396.—APPLICATION OF THE OUTSIDE STRONG CLAMP TO THE BROAD LIGAMENT.

the broad ligaments were very loose, and when the adnexa could be easily extracted. Here, the ligamentary pedicles being very thin, a ligature is applied *en masse*. The thread is repassed a few times by transfixion, and retied. Each pedicle is fixed on a plane with the vaginal wound, and the peritoneum is closed by a purse suture, care

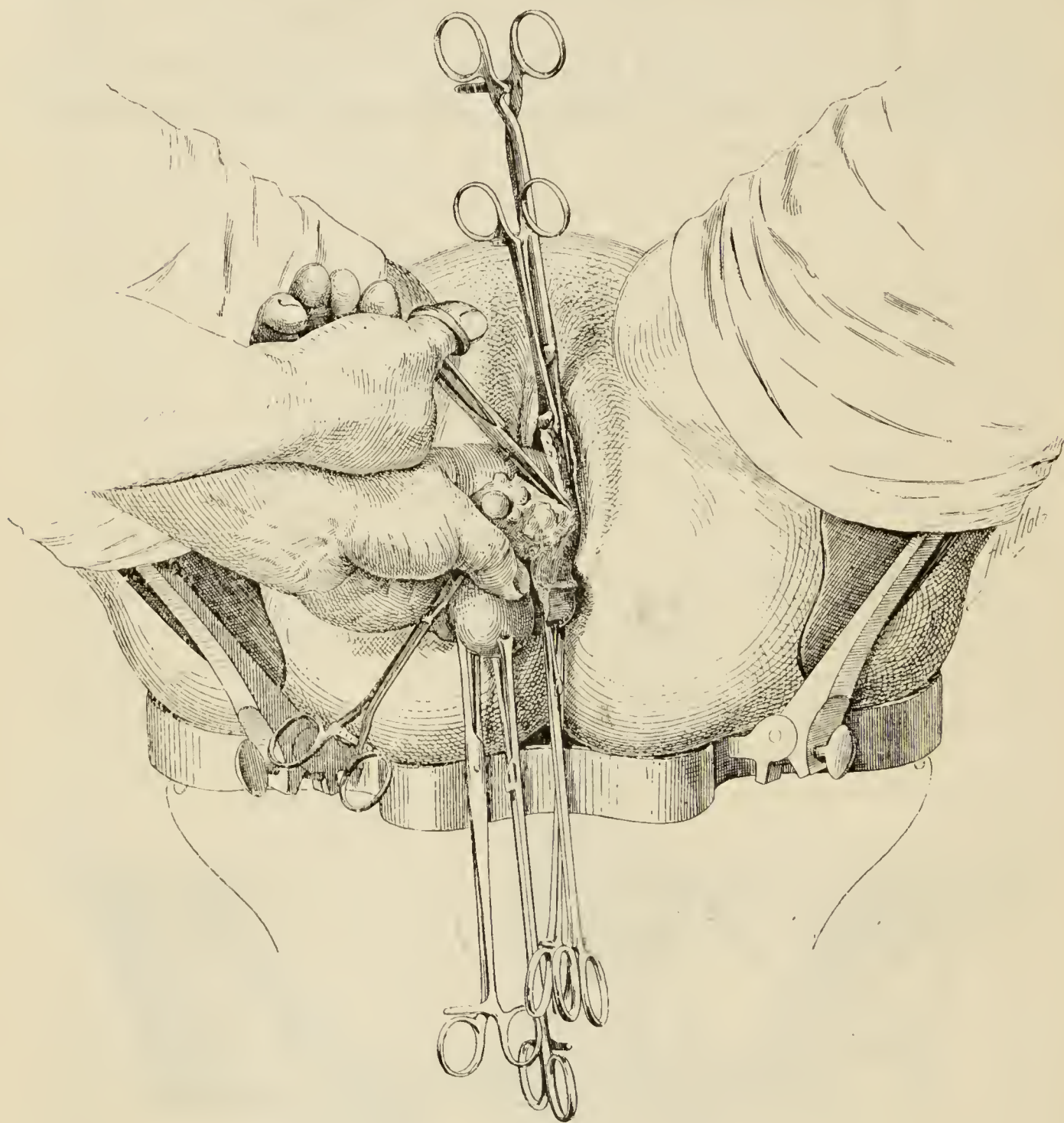


FIG. 397.—APPLICATION OF THE TWO CLAMPS, STRONG AND SLENDER, AND SECTION OF THE BROAD LIGAMENTS.

being taken to pass the thread at each side through the peritoneum of the pedicles above their ligature. The anterior and posterior serous flaps being carefully adjusted, a tampon is placed in the vagina, and allowed to remain in its position for four days, after which gentle douchings are commenced. The peritoneum unites above the ligatures, and the ligamentary stumps are eliminated by

the vagina. Doyen prefers forcipressure in all cases where there is difficulty through adhesions or otherwise, or in removing the adnexa, as the ligature then is difficult and does not afford as great security. He thus applies his clamp forceps :—

Taking the left adnexa by preference, these are drawn down, and the broad ligament is isolated between the left index and middle fingers, which are introduced from above, the one in front, the other behind, the ligament. The uterine neck has already been isolated as much as possible, and the fingers, reaching down by its side, determine the lower border of the ligament. A large clamp forceps is then introduced by the right hand, from above down, embracing the ligament. Should any intestine or omentum protrude, it is returned and supported by a compress, kept in position by a long curved forceps. The clamp is now firmly closed, after careful inspection of the part embraced by its blades. A second lighter clamp is placed in front, and the broad ligament is divided between it and the uterus. The adnexa remain adherent to the uterus.

Landau's Operation.—Landau's operation by clamp alone, which was described fully in the last edition of this work, has practically become an operation of the past.

In Landau's operation, which the author has seen him perform several times, the usual preliminary steps of freeing the uterus and adnexa having been taken, the latter were enucleated and any abscess débris evacuated. The broad ligaments were clamped at either side with Doyen's strong clamp forceps, supported by a slender pair of the same. The number of clamps applied to the broad ligament varied. When necessary, the uterus was divided with the scissors, from the anterior down to the posterior wall. Thus greater power was obtained over either half of the fundus. Hæmostasis was secured by forceps, and the vagina was dressed with iodoform gauze tampons which were not removed for forty-eight hours. Sometimes he practised complete morcellement of the affected uterus. After section of the uterus, the uterine segments were drawn down by strong claw forceps, and thus hæmorrhage was restrained. The broad ligaments were secured, and at times the uterus was brought away piece by piece with Landau's curved knife or special scissors. Such morcellation was absolutely necessary in some cases of fibroid, malignant disease, and extensive adhesions. Thus in Landau's operation no ligatures were used from first to last.

CHAPTER XXIX.

SURGICAL TREATMENT OF UTERINE MYOMA (continued).

Hysterectomy—Post-operative Treatment.

WHEN the operation is completed (see chapter on asepsis) the patient is placed in bed with a pillow under the knees and hot bottles to the feet.

A word of caution regarding hot-water pillows, jars, and bottles is necessary. I have known of most serious consequences arising, both on the operating-table and after a patient has been placed in bed in a semi-conscious state, from the pillow, jar, or bottle having been filled with water at too high a temperature, the mischief done not being discovered until too late, and extensive burns with, in some instances, deep sloughs following. To avoid this is part of the nurse's duty, but any accident that happens during or after an operation is apt, no matter how unjustly, to be laid at the surgeon's door.

The administration of a stimulant by the rectum may be necessary, or a subcutaneous injection of strychnine.

Shock.—Among the chief factors which directly cause shock after an abdominal operation is its prolongation beyond the capacity of the patient's vital resistance. The evil influence, however, of the length of an operation in causing shock will largely depend upon the unavoidable accidents which have occurred during its performance, as hæmorrhage, exposure and handling of the bowel, much dragging about of the parts operated upon, prolonged anæsthesia, also inadequate precautions for maintaining the body temperature.

In referring to death after abdominal coeliotomy, Smyly recapitulates the predisposing causes of shock.* Amongst these he dwells specially on the influence of debilitating diseases, such as cancer, bleeding myomata, and granular kidney, but more particularly, he says, is failure of the heart likely to follow in the case of those women who have what is commonly called weak hearts, with rapid and weak action: In such cases there is a tendency

* *Brit. Gyn. Jour.*, May, 1899.

to general stasis of the circulation, as also of the lymph-currents in the peritoneal cavity. Asepsis, a sound heart with undisturbed circulation, and a normally acting peritoneum, are the three most important factors in resisting the predisposition to shock.

A prolonged operation, much exposure and handling of the bowels, involving derangements of the functions of the peritoneum, are universally acknowledged to be specially dangerous in women in whom we are apprehensive of the occurrence of shock.

Sänger, to obviate the influence of a dry peritoneum, advocates the use of warm, moist protecting compresses, squeezed nearly dry, for covering the bowel and exposed intestine; others, as Zweifel, and Smyly himself, prefer dry sterilized gauze. Those I use are wrung out of weak formalin solution.

Signs and Symptoms.—Should alarming shock threaten during an operation, it is indicated by the extreme pallor of the face and coldness of the body, while, at the same time, the pulse becomes more rapid and indistinct. The respiratory movements are weaker, and become almost imperceptible. When such conditions occur, they are indications for increased care and precautions anticipative of post-operative shock. Anxiety is further added to should there be difficulty in rousing the patient from the anæsthesia. Here the administration (submammary) of artificial serum should be commenced at once and a subcutaneous injection of $\frac{1}{30}$ th gr. of strychnine given. The peritoneal cavity may also be flushed out with a warm sterilized saline solution. When, subsequent to the operation, such conditions are followed by a weak, compressible, and very rapid pulse, sustained coldness of the body, with perspiration and pallor, while the whole appearance of the patient is such as to indicate impending death, most active measures must be taken to counteract these conditions. Before she leaves the table strychnine should be given hypodermically with a drachm of sulphuric ether, and a brandy enema administered. The best enema is one of two ounces of brandy with six ounces of warm beef-tea. The strychnine is repeated in smaller doses at intervals, varied according to the degree of shock, as also are the brandy enemata. Every possible means is taken to maintain the body temperature of the patient by hot-water tins and bottles. The foot of the bed is elevated, and artificial serum is periodically injected. A persistent subnormal temperature and the absence of the evidences of reaction in pulse, temperature, skin, and consciousness are the most unfavourable signs. From such a condition of shock, attended by transient delirium, the patient may pass through the stage of reaction into

a state of traumatic delirium, the degree of intensity of which varies, and which may be succeeded by the subsidence of the symptoms of shock, a gradual lessening of the pulse, a rise of temperature, restoration of the general warmth of the body, better appearance of the patient generally, a return to consciousness, and the cessation of delirium. In such cases it is well to proceed cautiously in the administration of fluid by the mouth. The stomach does not, under such conditions, absorb well, and it is better to trust to the administration of nutriment and stimulant by the rectum. The duration of the treatment will depend upon the time over which the symptoms of shock are prolonged, and of necessity will be modified accordingly.

The Use of Artificial Serum.—Before injecting artificial serum into the cellular tissue of the mamma, the skin around and under the gland is well washed with antiseptic soap, some perchloride and alcohol solution is rubbed over it, and then the whole part washed over with ether. The sterilized needle (Fig. 89) is inserted for about two inches, and when the fluid begins to distend the part, absorption is accelerated by manipulating the gland. The serum is allowed to flow until the requisite quantity, from half a litre to a litre, is injected. The small wound left is closed with collodium. The most convenient solution is that of distilled water with chloride of sodium, sterilized by previous boiling for twenty minutes. It should be of the temperature of the body when injected, and therefore ought to be of at least 100° when placed in the receiver for use at the time of injection. Ten ounces may be introduced in a few minutes, and the quantity may be increased to over two litres without causing any symptoms of intolerance. This, however, should be the maximum at one sitting, and four litres within the twenty-four hours the outside limit in the great majority of cases in which the injection is indicated. The artificial serum may also be administered by the rectum.

Food.—Food is limited to the administration of small quantities of hot water, and possibly some barley-water, for the first twenty-four to thirty-six hours. Occasionally a little freshly drawn tea is allowed. As a rule, not until after thirty-six hours is it well to give milk, and then it is diluted.

If there be vomiting, nourishment is given by the rectum after it has been cleansed with a boric acid injection. Varying quantities of brandy, as indicated by the strength, with milk and yolk of egg or beef-tea, are administered. It is better to abstain in doubtful cases from concentrated meat essences until forty-eight hours at least have passed, but this must depend upon the condition of the patient.

Brand's, Valentine's, or Wyeth's are those most frequently used.

Carnick's beef peptonoids, in the form of suppositories, are useful. Of late years, operators are more inclined to feed patients sooner and more generously after operation. Experience, however, does not lead me to recommend such early feeding. The nature and amount of the nutriment given must altogether depend upon the condition and post-operative complications of the case. These must guide us as to the relative amounts to be given by the mouth or rectum, and the quantity of stimulating and supporting food that is called for. It is far safer to feel one's way, and to wait for the indications for solid food by the progress made, the quietness of the stomach, and absence of sickness. The pulse, temperature, and freedom from abdominal distress are our main indications.

Morphia.—It is best to abstain from the use of morphia, unless it be absolutely called for. It may well be combined with atropine in subcutaneous injection. If, however, the choice has to be made, as between sleeplessness and exhaustion from pain or nervous restlessness and irritability, and the ill effects of the morphia in interfering with digestion and intestinal action, the resort to morphia must be regarded as the lesser evil.

Tympanitic Distension.—Tympanitic distension and flatus are best met by the passage of a long rectal tube, which may be worn for a short time and passed three or four times in the day. This may be done with the patient in the knee-elbow position, as advised by Swatman. The light application of a Paquelin's or electric cautery to the abdominal wall in gentle touches, just sufficient to cause red lines, is an admirable method of treating tympany.*

Management of the Bowel.—Much has been written on the management of the bowel. It must be remembered that if a patient have been properly prepared for operation, and the bowel thoroughly emptied beforehand, there ought not to be that necessity for early administration of purgatives advocated by some surgeons. Their use must depend upon the symptoms of the particular case. If everything be going on favourably we may safely wait until the third morning, and then commence with gr. i. doses (in tablets) of calomel every hour until five grains are given. At the end of this time a full emollient enema is administered. Turpentine is a most valuable drug in cases of tympanitic distension, and may be used in an injection of an emulsion of yolk of egg with dill or carraway water. The treatment advocated by Baldy, of giving drachm doses of sulphate of magnesia every half-hour for five or six doses, is

* See also chapter on the Rectum.

generally effectual if the magnesia be tolerated; or another good plan, which I occasionally follow, is to give an enema no later than the morning following the operation. It generally operates. Two useful forms, if there be delay in movement or some abdominal distension, are—(1) Turpentine, ℥iv.; tinct. assafoetida, ℥iv.; ol ricini, ℥vj.; ol olivæ, ℥iv.; made into an emulsion with the yolk of egg, and added to a pint or more of thin starch water. (2) We may add to this ℥j sulphate of magnesia. An enema of alum has been strongly recommended as an efficient purgative in obstinate post-operative closure of the bowel. A seidlitz powder is another simple, and with some an efficacious, means of opening the bowel for the first time. The rectal tube is worn for a few hours at a time to permit the escape of flatus.

Use of the Catheter.—With regard to the bladder, the water is drawn off every six hours with glass catheters, treated in the manner I have referred to in the chapter on asepsis, and the surgeon should see specimens of the urine for several days, so as to judge of its condition and the state of the bladder.

Temperature of Room and Quiet.—The temperature and ventilation of the room has to be carefully supervised, and neither relatives nor friends should see the patient for a few days after the operation.

Dressing of Abdominal Wound.—If it be thought well to look at the abdominal wound, the hands of the surgeon and nurse should be prepared, and towels wet with carbolized water should be ready at hand with all necessary dressings on a tray. The bandages having been removed, the deeper dressings are covered with the warm towel, and this is allowed to remain on for a few minutes. Then the dressings are carefully raised, and the wound inspected. Should these be soiled, they are quickly replaced by fresh sterilized ones, and the bandages re-applied.

In the great majority of cases it is not necessary to disturb the actual dressing until the fifth or sixth day, if it be properly kept *in situ*, and there be no soiling; but the abdominal swathe ought to be changed from day to day, so as to give comfort to the patient.

The appearance of any serum oozing up through the lips of the wound, and redness or pouting of the suture apertures, are indications that the wound has to be watched. It is well to make light pressure on the sides of the wound so as to judge if any secretion be imprisoned, whether of serum or pus. Should this be so, a few of the loops of the suture at its lower end must be cut, and pressure made so as to evacuate the secretion; then a small drain of iodoform gauze soaked in formalin should be passed in, and the dressing

made twice daily. If a deep sinus be found this must be cleansed out with a sinus forceps, and some moist formalin gauze (1 in 1000) passed to the bottom of the track a few times until it comes out quite clean. Or a sinus syringe may be used to pass down the canal and gently wash it out.

Position of Patient in Bed.—As regards the position of the patient, the dorsal one is the best, as a rule, for the first few days, and even longer than this in vaginal hysterectomy. It is both on clinical and anatomical grounds the safest, but she may be permitted to turn on her side and vary the posture after this. This rule as to position may, however, be relaxed, according to the feelings of the patient and other considerations. There is nothing to be gained by enforcing the dorsal position to her discomfort, as this only contributes to restlessness.

From the experiments of Muscatello, who showed that leucocytes, wandering cells and granules, were carried through the lymph spaces from the peritoneal cavity into the blood, a current existing with a direction towards the diaphragm, reaching the lymph glands of the thorax, the liver, and spleen, these currents being influenced by gravity, the pumping action of the diaphragm, and the vermicular action of the intestine, Bishop urges that this action should be excited as soon after operation as possible, so that we may have its aid in carrying stray micro-organisms away from points where they are likely to develop into the lymphatics and glands. Thus early action of the bowel and the inclined position of the bed are two important points in the post-operative management of hysterectomy. Heywood Smith first advocated this elevation of the feet by the placing of blocks of wood under the legs of the foot of the bed.

Thirst and Vomiting.—Thirst, if not excessive, is met by repeated sips of water and small quantities of iced lemonade, with a few drops of dilute phosphoric acid added. Ice by itself is better avoided. If the thirst should prove excessive, the proper plan to adopt is to pass a large saline enema into the rectum.

Clark and Howard Kelly administer the saline under an anæsthetic. If it be given as a preventive, it must be used at the close of the operation while the patient is still on the table. Not only is thirst alleviated, but vesical irritability is prevented, and the specific gravity of the urine is lowered. The amount of fluid given by the mouth must, of course, be increased. Greig Smith, remarking on the vomiting of peritonitis, says it 'is not of a sort to be controlled by medicine; indeed, it is doubtful if it be desirable to check it.' The vomiting, as he points out, frequently relieves the distended bowel of its liquid and gas. He found 'the administration of as much fluid as the patient

will drink—soda-water, weak tea, or simple warm water—is followed by the evacuation of bilious fluid and gas, making her comfortable in a few hours.'

More harm than good is generally done by drugs given to check vomiting, and the safest course to adopt when sickness begins and does not yield to ordinary remedies, is to resort at once to rectal feeding, and to employ lavage of the stomach, especially if the vomited matter be dark or black in colour. I find, in mild cases, an effervescent mixture, made by placing a powder of carbonate of soda with carbonate of bismuth in a mixture of citric acid or lemon juice, with the liquor bismuthi, is often effectual in checking the nausea.

R. Bismuthi carb., ℥iss.
Sodii carb., ℥iiss.
Liq. bismuthi (Schaeht), ℥iv.
Syrupi Simp, ℥iv.
Aquam ad ℥viii. ℥iv.

℥ss. to be taken with ℥ii. of the acid mixture. The latter is either pure lemon juice or a mixture of 32 gr. to the ounce of citric acid.

Iced champagne given in small quantities frequently is of service, and a sinapism may be laid over the epigastrium. A mixture containing weak lemon juice and dilute phosphorous acid given occasionally in sips has also a good effect in allaying thirst.*

Post-operative Complications: Peritonitis—Different forms of: Traumatic; Septic. Obstruction of Bowel; Ileus.—In the various forms of peritonitis, whether of the ordinary traumatic or plastic kind, or that due to septic infection, with its consequent septicæmia, we have to deal with the most anxious and alarming post-operative conditions that follow upon cœliotomy. There is a train of symptoms which, when they occur, leave little doubt as to the dangerous complication we have to fear and treat. These are: some swelling in the epigastric region attended by pain; the pulse becomes more rapid, and is altered in character, feeling less compressible and gradually becoming harder; the temperature rises, at first a degree or two, and then becomes more elevated, with some fluctuations; the patient grows restless, the facial expression is somewhat anxious, there is pallor of the countenance. These symptoms may take some time to develop, or they may progress with alarming rapidity. According to their relative degree of severity we have an indication of the danger to which the patient is exposed.

In not a few cases the pulse and temperature ranges are very erratic. Though the case progresses favourably otherwise, the temperature, or pulse, or both, do not fall to normal. These cases keep the surgeon anxious,

* Cachets of Benzo-naphthol in many cases of sickness with foul breath are very useful—5 to 10-grain doses.

and rightly so. As between bowel, temperature, and pulse, I am inclined to place most importance in their relative order to bowel, pulse rate, and temperature.

As simple peritonitis is the least dangerous form, and frequently with treatment subsides, the pain lessening, the temperature receding, and the pulse softening and decreasing in rapidity, it becomes a matter of great importance to note those signs and symptoms

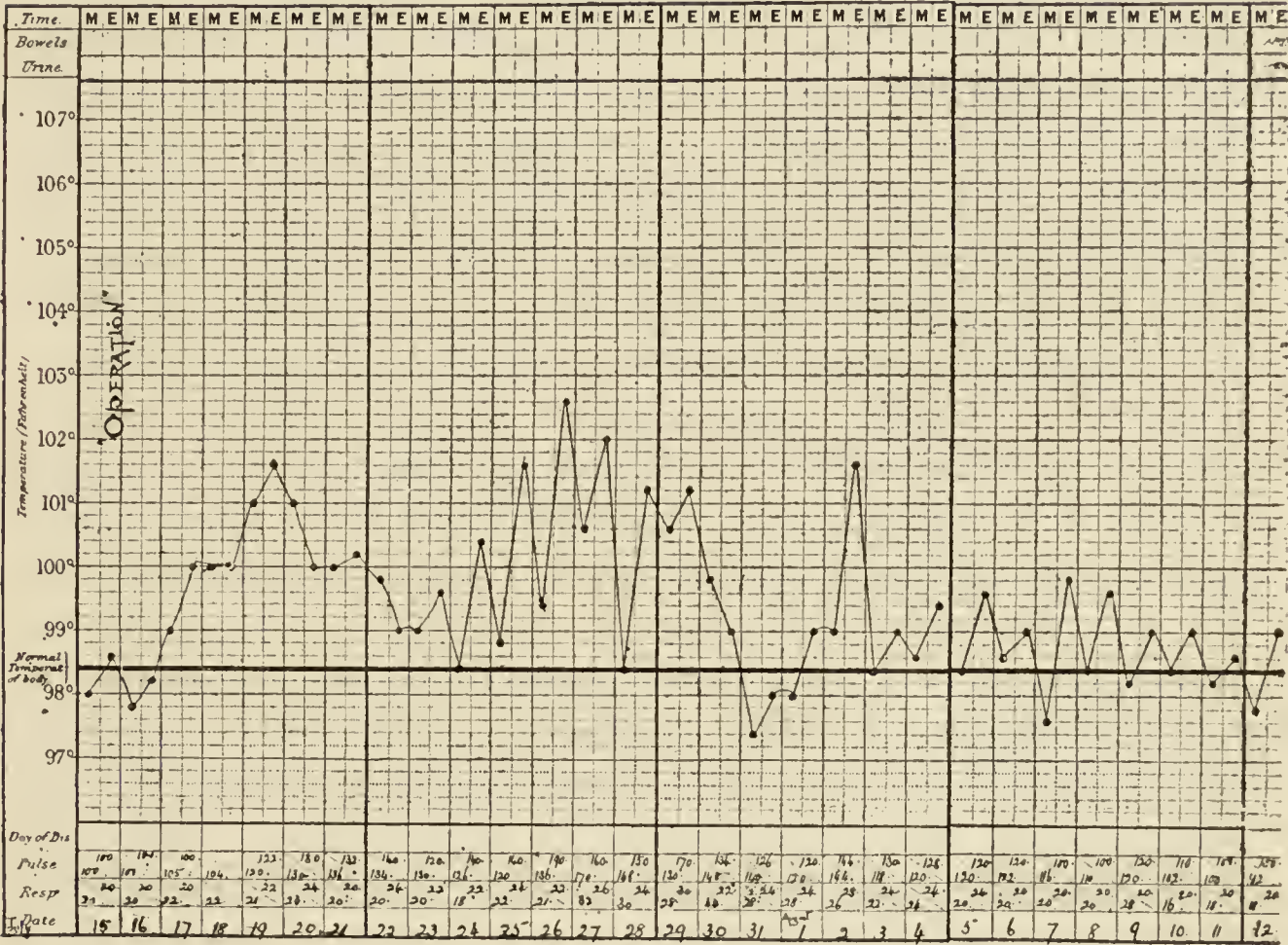


FIG. 398.—TEMPERATURE CHART OF CASE ON WHOM SUPRA-VAGINAL HYSTERECTOMY WAS PERFORMED FOR A LARGE MYOMA FIXED IN THE PELVIC FLOOR BY ADHESIONS.

The pulse remained exceptionally high throughout convalescence, and the temperature was also very high at times, the pulse reaching to 170 and the temperature to 102·3 on the fourteenth day after operation. Nevertheless the patient made an excellent and permanent recovery and there were no complications.

which assist us in differentiating the causes of post-operative peritonitis.

If there be localized peritonitis setting in after the operation, and occlusion or strangulation of a distant part of the intestine be the consequence, the most important signs are the presence of meteorismus of the strangled loop of intestine which is recognizable to the view, and can be defined by palpation or percussion (Wahl.),

together with peristalsis of the intestine, limited to the obstructed portion of the bowel (Schlange).

Such localized peritonitis is generally of the traumatic character, and this form is not, as a rule, attended by the graver symptoms found in true obstruction or in septic peritonitis. Still, it must be remembered that such traumatic inflammation and exudation are frequently the forerunners of graver states, and may in themselves lead to strangulation of the bowel and complicate ileus. We have, however, early warning in the rapidity with which the symptoms follow the operation, the severity of the pain, the comparatively slight elevation of temperature, the general aspect of the patient indicating no profound systemic change, more especially in the absence of excessive vomiting and extreme rapidity of pulse. If sepsis be the cause of the peritonitis, and we have to face that most dreaded of all operative states, septic peritonitis, the train of symptoms is generally unmistakable. In this case all the usual evidences of peritonitis are accentuated ; though it does not set in so early as in the case of the simpler form, there is an alarmingly rapid development of symptoms, pointing generally to a fatal issue.* We may summarize these thus : great increase of anxiety on the part of the patient ; pain, at first extreme, possibly not continuous, and becoming less as death approaches ; uncontrollable vomiting, at first of the contents of the stomach, then of a greenish or dirty-coloured fluid, finally dark-coloured or almost black ; considerable tympanitic distension, though cases do occur in which the intensity of the poison appears to be so great that neither is there pain nor any considerable tympanites.

The condition of the mind varies. In some it remains quite clear, and there is little or no delirium. In others, it is constantly present. The temperature reaches to 104° or 105° Fahr. ; and the pulse, becoming more rapid, ranges from 130 to 140 or more. This is characteristic septic peritonitis.

If there be septic intoxication as a consequence of the peritonitis, the patient may suffer from pyæmic conditions, as abscesses, pleurisy, pleuro-pneumonia, pericarditis, and endocarditis.

Ileus.—Should we have to deal with a strangulation and resulting ileus due to any cause, we are assisted in our diagnosis by the more paroxysmal nature of the pains and the usual signs and symptoms of ileus, such as the peristaltic contractions of the bowel, the tendency to collapse which follows these, and the difficulty or

* See page 514 *re* hematemesis after hysterectomy.

impossibility of obtaining a motion. Such griping or colicky pains are quickly followed by nausea, vomiting, and tympanites, and if there be no relief the patient dies with all the usual symptoms of strangulation, with possible gangrene of the intestine or omentum. Should the ileus remain unrelieved for any time, the symptoms merging into those of general peritonitis, it is most difficult to distinguish between the two affections.

Intestinal Obstruction and Ileus.—Uhlman noticed in Zweifel's clinic that adhesions were never found between coils of intestine, save in parts which had been denuded of peritoneum. Paroxysmal pain, arrest of the peristaltic action of the intestine, cold perspiration, absence of flatulent expulsion by the bowel, are also some of the most pronounced of the early symptoms of ileus. Smyly advocates early reopening of the abdomen should the ordinary means of treatment of the obstructed bowel not succeed.

Martin of Birmingham thus tabulates the causes of intestinal obstruction:—

- (1) Inclusion of intestine between the lips of the abdominal wound.
- (2) Transfixion of intestine while suturing the wound.
- (3) Constriction of the rectum by utero-sacral folds, when there is much tension on the stump after hysterectomy.
- (4) Annular constriction of the rectum by a hæmatocele.
- (5) Paresis of the bowel from atony and flatulent distension in a feeble woman after removal of a large ovarian tumour.
- (6) Paresis due to peritonitis.
- (7) Secondary obstruction—(a) due to adhesion of a coil of intestine to a raw surface, such as the cut surface of a pedicle, left at the close of operation; (b) due to matting of intestines after peritonitis.

Prophylaxis.—The surgeon is hopeless who does not realize that the causes of any form of peritonitis following operation are probably, though not necessarily, to be found in some want of aseptic precaution or operative defect during its performance, at any rate in a large proportion of cases.

It is well to epitomize these prophylactic points in the performance of an operation, the observance of which will considerably minimize the consequent risks of peritonitis.

- (a) The closest attention to aseptic details.
- (b) Careful protection of the bowel, with as little injury or handling of it as possible.
- (c) Cautious freeing of intestinal adhesions, whether inter-intestinal or intra-pelvic.
- (d) Avoidance of strangulation of the omentum by sutures or ligatures, and careful replacement of it before closing the abdominal wound.
- (e) Perfect adaptation of the peritoneal edges, and the covering by it of all denuded surfaces.
- (f) Effective drainage in suitable cases.
- (g) Avoidance of the necessity for prolonged anæsthesia by as great

rapidity of operation as is consistent with the complete arrest of hæmorrhage and attention to the foregoing details.

Such care will in the majority of cases obviate the necessity for a drainage tube, in itself a potent source of peritoneal complications.

Sepsis from Approaching Death.—Fritsch lays special stress on those cases in which the physiological functions of the peritoneum are interfered with, and attributes the early onset of dangerous symptoms which occur without rise of temperature before the second day to this cause. The early symptoms of tympanites, dry tongue, and rapid circulation are characteristic of this class of case. The temperature does not rise until the second day, *and the patient does not die because she is septic, but she becomes septic because she is dying.*

Reopening of the Abdomen.

It must ever be a matter for the gravest consideration whether or not the abdomen should be opened when symptoms of peritonitis or what appear to be those of septic peritonitis or ileus are present.

Much will depend upon the nature of the operation; the conditions found during its performance; the presence of secretions, whether of serum or pus; and the probability of post-operative adhesions having formed. Secondly, on the determination as to the nature of the peritonitis, and the view that obstruction, if present, is due to strangulation. Thirdly, where signs generally point to the presence of ileus. Fourthly, the occurrence of intra-peritoneal hæmorrhage, whether sudden or slow. Here the usual evidences of internal hæmorrhage, in pallor, the thin and compressible pulse, general restlessness and distress, are sufficiently indicative of this accident, leaving the surgeon no choice but to operate at once.

When peritoneal complications declare themselves, the first essential point is to secure free action of the bowel. I prefer small doses of calomel given every hour for four or five doses. At the end of this time a saline purgative is administered, unless we are uncertain of its tolerance by the stomach, when an enema is substituted. Here, again, where there is nausea or tendency to vomiting, we had better solely rely on rectal feeding.

Ice to Abdomen.—Perhaps the most effectual of all means of checking peritonitis is the application of a light ice poultice over the abdomen. The ice is finely pounded and placed between two layers of flannel and covered with protective; or an abdominal ice cap is laid on with a layer of flannel underneath.

Examination of the Wound, and Exploration of the Abdomen and Pelvis.

Should the wound show signs of inflammation and suppuration, it must be immediately re-opened, thoroughly cleansed with weak formalin solution, and drainage resorted to. It may be necessary in urgent cases, where we fear septic intoxication and the symptoms point to septic absorption (especially should any complication have occurred during operation to justify a suspicion of consequent

sepsis), to open the wound at once and examine it. The bowel in contact with it is examined, and the intestine is carefully covered with hot sterilized cloths. When the bowel has been pushed aside, the pelvic cavity, the stump of the cervix if myo-hysterectomy has been performed, and the pouch of Douglas, are all explored, and, should it be necessary, the pelvis is flushed out with warm sterilized saline solution.

Having thoroughly disinfected and cleansed the pelvic cavity, the lower portion of the wound is left open, the pelvis is loosely packed with sterilized iodoform gauze, and a piece is allowed to protrude from the lower end of the abdominal wound to serve as a drain. In these post-operative procedures, chloroform is the best anæsthetic to select. We must not forget the part taken by the Trendelenburg position in the production of ileus, as, owing to the falling down of the intestines, a loop may pass through an opening in the omentum, and this lead to strangulation. Should we suspect that ileus has supervened, and that there is associated obstruction, there can be no doubt that calomel is the sheet anchor; and here a dose of five grains may be placed on the tongue, followed by the administration of a large enema. Should this latter return, and no motion follow, sulphate of magnesia, given as we have already indicated, is the best saline purgative under the circumstances, if the stomach will tolerate it. If the symptoms persist, especially if there be recurrence of severe pain and persistent vomiting, the abdomen must be opened, and the site of the strictured bowel be sought. Adhesions of coils of bowel to each other or to the stump should be looked for, and these must be gently separated, and in the most delicate manner, any tear being at once repaired with fine silk sutures. Any intestinal injury caused in the reduction of the obstruction should be immediately closed, and perfect cleanliness of the abdominal wound secured.

In searching for the source of obstruction in ileus, or in the manipulation of adhesions, every antiseptic and aseptic precaution has to be taken, and the abdomen and wound thoroughly disinfected before the sutures are removed. The temperature of the room in which the operation is performed should be over 70°. Every preparation must be made to protect and keep the bowel warm, the table on which the patient is placed should be heated or covered with hot blankets, and hot water-bottles be ready for the feet; and then, commencing at the ileo-cæcal valve, the search is continued until the limit between the dilated and collapsed portion of intestine is reached. Then the adhesion is separated, or any band is divided, the bowel returned, and the abdomen closed with all the usual precautions.

Injuries to the bladder and ureter, with resulting complications, require special management, according to the extent and character of the rent and its situation. These matters are dealt with in the chapter on the Bladder and Ureters.

Secondary Hæmorrhage.—This is probably the most serious of all post-operative conditions, and has its commonest cause in the slipping of a ligature, or too hasty and ineffectual hæmostasis. Neglect in thoroughly securing the pedicle of a tumour, and its severance too close to the ligature, are other sources of secondary bleeding. Some surgeons affect to despise that bleeding, which is said to be '*only an oozing*,' but which, if we carefully staunch the surface and watch the source from which the blood comes, we shall generally find is due to one or two small vessels which have escaped torsion or ligature.

It is the complete control of all bleeding, and accurate peritoneal adaptation, that stamps the operation as being perfectly and safely finished.

The recognition of these facts by surgeons, added to the growing determination not to sacrifice the safety of a patient *at the cost of a little extra time devoted to the arrest of all bleeding*, has lessened in recent years the occurrence of secondary hæmorrhage.

In the ligature of vessels some surgeons prefer silk to catgut, as they consider that it is less likely to loosen or slip. This defect, to a certain extent, depends upon the character of the gut. I use gut almost entirely all through the operation. Howard Kelly recommends that all large vessels, such as the ovarian or uterine, should be tied first with silk, and then the open mouths caught and tied with catgut. It is much safer not to trust to mere torsion or compression either with angiotribe or ordinary hæmostatic forceps in abdominal operations.

Symptoms.—In their relative order the following are the most striking evidences of hæmorrhage: There is a sudden change in the patient's condition; her countenance becomes more anxious, and there is increasing restlessness. This latter symptom quickly increases, the patient throwing her arms about as well as her legs. The pulse suddenly increases in rapidity, is weak, compressible, or fluttering. The respirations also increase and become gasping. The pallor of the countenance, the coldness of the extremities, and the clammy skin complete a group of symptoms which, when followed by a subnormal temperature, are unmistakable.

Treatment.—In the face of such symptoms there is but one course to pursue: the abdomen has to be reopened, the source of the

hæmorrhage sought for, and the bleeding vessel or vessels secured. But before this is done, temporary means must be at once adopted. These consist of a subcutaneous injection of strychnine, and the administration of brandy by the rectum, this being repeated within a short time. Immediately before the operation is commenced artificial serum is injected. In such cases time is of the utmost value, so that it must not be lost in too elaborate preparations.

Every possible care is taken to maintain the body temperature during and after the operation. The surgeon and assistant having sterilized their hands, the wound is opened from below, two or more sutures are divided, and the margins of the abdominal wound having been separated, the peritoneum is caught well up with catch forceps and opened. Immediately, the blood makes its appearance in the wound, and simultaneously two fingers are carried down into the pelvis. The uterus will be a guide to direct the finger. If the ligature has slipped, both broad ligaments have to be exposed,

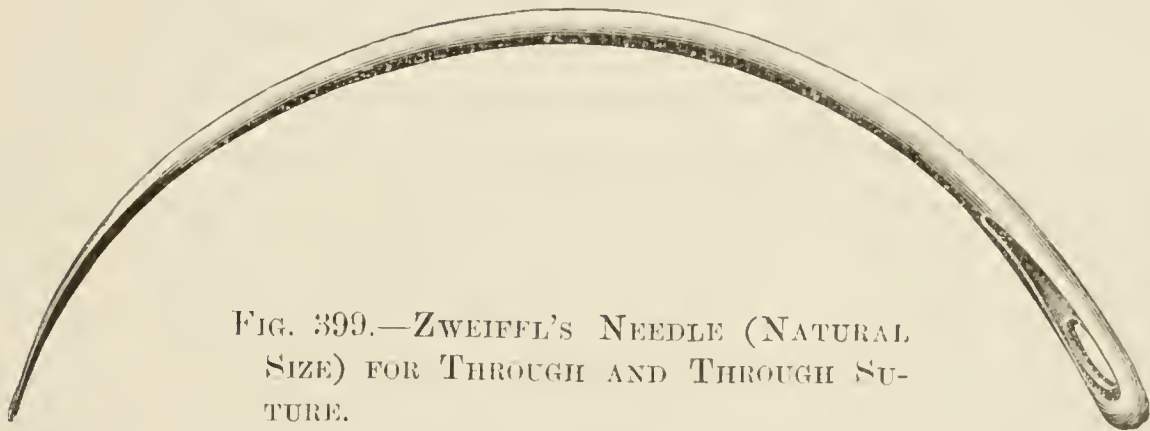


FIG. 399.—ZWEIFFEL'S NEEDLE (NATURAL SIZE) FOR THROUGH AND THROUGH SUTURE.

sponges being used to remove the blood, and temporary clamps are placed both on the cornu of the uterus and on the outer extremity of the broad ligament. This having been done, and the cause of the bleeding been successfully met, the ovarian vessels are secured and the broad ligament is again carefully ligated. In a case of pan-hysterectomy, the pelvic cavity may have to be explored, the blood stanchied as far as possible after temporary clamping of the broad ligaments, and any bleeding points searched for. Here, again, both uterine and ovarian arteries are secured, and fresh ligatures are placed on the broad ligaments. If the operation has been that of myo-hysterectomy, the cervical stump is seized and pulled well up towards the abdominal opening, so that it may be inspected, and, if the hæmorrhage proceed from it, a ligature is passed below the bleeding point, and the vessel is thus secured. The abdominal wall is closed, and it is better to lose no time by separate adaptation of the parietal layers, but to close the wound rapidly by passing gut,

or silkworm-gut sutures through the entire parietes. Here Zweifel's through and through needle is most useful for rapid sewing of the wound. The patient is now removed to the warm bed which has been prepared for her, the foot of which has been elevated, and a submammary injection of artificial serum is given, with one of brandy into the bowel. If she be very collapsed, these had better be administered while she is on the table before removal to bed. When there, a subcutaneous injection of strychnine is given, and this must be continued at intervals, care being taken so as not to produce toxic symptoms from the drug.

High Temperature.—While we may take it as the rule that, excluding the ordinary variations which occur within the first twenty-four hours or so after operation, the aseptic case runs a normal course with but slight deviation, rarely passing above 99°, there are others in which, so far as the wound or the operative tract is concerned, everything is surgically perfect, yet erratic variations happen that it is difficult to account for, and which may cause unnecessary alarm and anxiety. It is mainly in those patients with a nervous temperament that such a rise of temperature is met, and unquestionably the most unfavourable patients for abdominal operations are those whom we should class as neurotic or hysterical. They are the most sensitive, apprehensive, impatient of pain, difficult to feed, and restless. The very restlessness itself is sufficient to disturb parts, disarrange dressings, elevate the temperature and pulse, upset the digestive functions, and predispose to mischief that otherwise would be avoided. There can be no doubt that temporary pyrexia is often caused by blockage of the bowel, want of care in maintaining an even temperature in the room, or in regulating the covering of the patient. It also may be the result of an injudicious visit of a friend or relative, pain, sleeplessness, premature administration of solid food, some vesical derangement, or the toxic effects of iodoform. The temperature rises from irritation in the track of the abdominal wound, the collection of serum in the neighbourhood of the sutures, or threatening of stitch-abscess. On the whole, however, it is always safest to look upon an elevation of temperature as a danger signal, and one not to be neglected. The ranges of peritonitis and septicæmia are unmistakable, though it does occur that an abnormal temperature will sometimes attend upon the course of a perfectly straight surgical convalescence. A few doses of phenacetin or antipyrin given in cachets, washed down with an effervescing citrate of potash mixture,

is a simple but generally successful method of meeting some rise of temperature which has not any infective origin. A few grains of quinine may be combined in each cachet. A saline purgative and a grain or two of calomel are given, and the bowel is opened. Absolute quiet is secured, and the visit of any friend is prohibited. The elevation of temperature caused by peritonitis, sepsis, or stitch-abscess is treated in the manner described in discussing these complications.

Fæcal Fistula.—If after an abdominal or vaginal operation a fæcal fistula should result from injury to the bowels, or necrosis from pressure, the first principle is to keep the fistulous canal isolated as far as possible, while steps are taken to disinfect it. Dressings or tampons that indicate by the odour or discharge that fæcal matter is present must be frequently changed, and the skin round the wound kept scrupulously clean.

If the fistulous opening be on the abdominal wall, a few loops of the ligatures should be divided and the fistula washed out with a formalin solution. By injecting a warm saline solution into the rectum, should the fistula have its origin here, the fluid wells up through the abdominal opening, and a long flexible probe passed down the fistula will determine this. Such washings are daily repeated. With a long crochet needle or hook the canal may be searched for any retained ligatures, which then are detached, or if possible, cut.

If despite all such efforts the fistula will not heal, then there only remains the radical operation of cutting down on and isolating the fistulous track, dissecting it out, if this be possible, and closing the bowel opening by sutures, or enveloping it with a gauze pack, so as to induce the formation of new granulation tissue. An attempt is made at the same time to cover it with peritoneum and adjacent bowel.

If fæcal matter escape and find its way on to the dressings after a vaginal hysterectomy, the rectum must be kept well cleansed with boric acid and formalin injections, fæcal accumulations prevented, and the vagina should also be douched four or five times in the day. If there be any suspicion of pent-up matter, and the sutures have not been removed, these should be cut and withdrawn. A gauze drain is kept against the opening, and a free vent for any discharge is allowed. Any attempt to close the rectal fistula must be postponed.

CHAPTER XXX.

CANCER OF THE UTERUS.

Etiological—Pathological.

ACCORDING to its location, cancer of the uterus may be limited to the body, the cervix, or the portio vaginalis. We thus speak of 'cancer of the body,' 'cancer of the cervix,' and 'cancer of the portio vaginalis.' And this clinical division, according to the location of the disease, has its justification on strict grounds of pathological differentiation. The classification of the older writers into medullary, epitheliomatous, and scirrroid has still its clinical significance. Yet malignant disease is found both in the cervix and body of the uterus, in the former mainly as malignant adenoma, adeno-carcinoma, and adeno-sarcoma, while in the body we find carcinoma, sarcoma, and myo-sarcoma, more frequently. Certain types of papilloma are associated both with the benign and malignant growths, as, for example, papillary adeno-sarcoma and papillary cysto-adeno-sarcoma. Papillary outgrowths of a cartilaginous, myxomatous and adeno-myxomatous nature have been recorded of the malignant type (Mundé, Thiede, Winckel). Calcareous and fatty degenerations have been found associated with those of the carcinomatous kind.

Malignant Adenoma of Cervical Glands.—Alfred Smith reported a case of malignant adenoma of the cervical glands. The uterus was removed by vaginal hysterectomy. The recovery was uninterrupted. 'Malignant adenoma of cervical glands is, according to C. Gebherd,* extremely rare; he can only find a record of six cases. Ruge and Veit † say that cases of adenoma in the pure form are seldom met with, and Bröse ‡ agrees with them also in the extreme rarity of this affection. Smith's specimen microscopically showed the upper portion of the cervical canal greatly distended and excavated. The lower portion was apparently normal. The microscopic section showed a columnar cell epithelioma.' §

* *Zeitsch. f. Geburtsh. u. Gyn.*, bd. xxxiii., heft 3, 1895.

† *Idem.*, 170. ‡ *Idem.*, 134. § *Medical Press and Circular*, 1895.

Recent Researches on the Pathogeny of Cancer.

The recent researches of Bretland Farmer, J. E. S. Moore, and C. E. Walker, brought before the Royal Society * are of extreme interest, as throwing an important light on the initial cell changes that occur in the transformation and spread of a malignant growth. These researches would tend to show that the serial cell changes of an invading and proliferating malignant tissue are very 'similar to those obtaining during the maturation of the elements contained within the sexual reproductive organs,' even extending to 'minute points of detail.'

When segmentation of an ovum occurs, 'the nuclei of all the resulting cells are found to contain a definite number of *chromosomes* during each nuclear division.' The evolutionary changes through which the chromosomes pass are as follows:—There is an aggregation of granules of a stainable substance (chromatin) arising out of the material from which the chromosomes originate as definite structures. They are constant in number for each species of animal or plant, and divide longitudinally into two daughter-chromosomes, and in their division are arranged in a definite manner on the spindle, *frequently appearing as V's, with the apex directed towards the axis of the spindle.* Fission provides the twin nuclei, and these, whenever new somatic cells are formed, undergo similar division. In the case, however, of the sexual elements, the *gamotogenic* cells, which are the source of the former, can be differentiated from the somatic at a very early period, or may only be capable of demonstration further on. The somatic and gamotogenic cells differ in the process of mitosis, in the period of rest and growth; the gamotogenic chromosomes formed from the resting nucleus are only half in number as compared with those present in the dividing nuclei of the somatic chromosomes; the form of the gamotogenic and somatic chromosome is markedly different; the fission in the former is transverse and not longitudinal. The descendants of gamotogenic cells retain under normal conditions the reduced number of chromosomes mentioned, and the cycle of cell generations ends in the formation of ova or spermatozoa. When the fusion of the two occurs, the somatic number is restored, this being characteristic of the fertilized ovum and the cells into which it divides until the peculiar transverse division in the gamotogenic cells makes its appearance. After such division a further cleavage may produce four sexual cells. In the case of plants, this arrangement is not so definite in the number of cell generations before the ultimate sexual cells are evolved.

Applying this knowledge to the pathology of a rapidly growing epithelioma, in the earlier proliferation of the Malpighian layer, the characteristic somatic division is observed 'exactly as in the earlier stages of reproductive tissues.' But 'as the multiplication proceeds, however, a change passes over the cells themselves. The protoplasmic continuity to which the "prickly" character is due, becomes more or less obliterated, and the cells assume that appearance

* December, 1903.

of indifferent germ tissue so well known as a feature of the elements of which such are largely made up.'

The point of extreme significance is this, that in the zone behind the advancing edge of the neoplasm, enlarged cells are seen, each containing a nucleus of large size. As fission occurs, its chromosome is in the form of a thickened loop or ring, *which splits transversely*, as in the case of pronuclear division of the normal reproductive tissue, and in number these chromosomes are less than in the normal somatic cells of the surrounding tissue as in the case of the gametological cells. Such phenomena occur in other types of malignant disease as well as epithelioma, but in benign tumours they are absent.

The authors of these researches regard the transplantation or transmissibility of malignant disease from individual to individual as possible, 'where it is conceivable that the repeated application of a suitable stimulus or of the continuous introduction of cells which have undergone the changes (they have described) can happen.'

The Correlations of the Pelvic Lymphatics in Malignant Disease of the Uterus.

Emil Ries of Chicago,* who has removed the pelvic lymphatics with the carcinomatous cervix since 1895, speaking from the examination of some twenty thousand sections, says, that 'carcinoma of the uterus invades the pelvic lymphatics, just as early and with as much certainty as carcinoma of other organs invades the regional lymphatics.' *He asserts the identity of the carcinomatous structure of the gland with that of the original carcinoma*, both in the cell, the cell arrangement, and the progress of the change. A specimen in his possession proves beyond possibility of doubt that 'particles of carcinoma are carried away from the original seat of the cancer by the lymph current, and begin to grow in the new location.' Hence, in 'our operations it is always unsafe to cut between the regionary lymphatics and the original carcinoma, as we never know where we may come across carcinoma in the course of the operation.'

The invasion takes place in the connective tissue of the hilus, next in the germinal centres of a few follicles or medullary cords, so that follicular cavities are formed by pressure. This invasion proceeds until the entire gland becomes a carcinomatous nodule, and only by the remaining follicle or medullary cord can we ascertain that a structure is glandular. These follicular cavities may fill with extravasated blood or degeneration products, and the cysts formed may coalesce, creating a hollow mass of carcinoma easily bursting during attempts at removal. These affected glands are not necessarily large, or *vice versâ*. Ries draws attention to the presence of epithelial ducts in the lymphatic gland, either in its capsule, the trabeculæ, or, later on, entering into its tissue, *but always following the course of the trabeculæ*. The ducts are composed of low or high columnar cells, sometimes with bristles at the top, and with a nucleus in the middle of the cell. They are either straight or ramified, are surrounded by connective tissue, and their

* *Amer. Gyn.*, July, 1903.

contents either degenerative cells or leucocytes. The stratified nature of the original carcinoma in some of his cases made it quite clear that these epithelial ducts did not harmonize with it. There may be an adeno-myoma present with the carcinoma, and Ries thinks that the connection between the posterior pelvic wall and the Wölfian body from which adeno-myomas originate is so close that it is quite possible that its remnants may have become embedded in the lymphatics located on the posterior pelvic wall. Hence, the presence of these epithelial ducts.

Ries also notices the large cell hyperplasia and the hyaline degeneration which are present in the connective tissue stroma of the glands, affording an explanation of the calcareous deposit which is found in the degenerating lymphatic glands; a fatty degeneration is also present. This fatty metamorphosis led Ries to believe that, 'seeing it is found under normal conditions, in the lymphatic system, a constant fluctuation is taking place, new glands forming as older ones lose their function, this occurring anywhere in the connective tissue.'

The presence of hæmo-lymph glands containing red blood corpuscles mixed with leucocytes has also been established by Warthin (Michigan) and been confirmed by Ries. 'With their direct communication with the blood-current they offer an entirely new explanation of the different ways in which carcinoma of the uterus, or anywhere else in the body, may form metastases. Formerly, it has been assumed that carcinoma proceeds along the lymphatics. If carcinoma proceeds to a lymph gland which is in connection with the blood-current, there is nothing to prevent the carcinoma from pervading the whole system.'

Gellhorn* (see also p. 554), in a survey of the whole question of lymphatic infection, arrives at the conclusion that, while the lymphatic system is the avenue along which the disease travels, it by no means follows that the lymph glands are early involved. The regional pelvic glands are affected in some one-third of the cases, especially where the primary cancer involves the parametria and adjacent structures, but not as a rule in the early stages of the disease. The disease may travel by the path of the lymph radicals and the lymph spaces of the nerves, and the sacral plexus may thus be attacked. The portio vaginalis, the vagina, the paravaginal tissue, and the connective tissue, are successively invaded, and much more commonly than the bladder and rectum.

Carcinoma (Adeno-Carcinoma) of the cervix generally proceeds through the cervical tissues horizontally, or invades the corpus, and, not so often, the vagina, while the involvement of the pelvic glands is relatively more frequent, and takes place in an earlier stage than when the vaginal portion is affected. In cancer of the body there is slower extension of the disease, and a greater tendency to its limitation to the uterine cavity, nor are metastases so frequent.

Implantation Metastases.—Olshausen has recorded several cases of implantation metastases in the abdominal wall. Six of these occurred at varying periods after the removal of malignant ovarian tumours, and two cases after extirpation of a carcinomatous uterus. The latency of the cancer

* *Amer. Gyn.*, Nov., 1902.

in some of these cases is remarkable. Purefoy has recorded a case of a secondary growth in the abdominal cicatrix after hysterectomy, and one after the removal of an ovarian cyst.

Anatomy of Pelvic Lymphatics and Glands.—In regard to the anatomy of the lymphatic vessels and glands of the pelvis, Gellhorn,* from the researches of Sappey, Poirier, Russell, Piser, Bruhns, and Waldeyer, notices their regularities in the distribution of the pelvic lymphatics. An important gland is the utero-vaginal, a short distance from the cervix in the parametrium. The lymph channels of the cervix, and the upper third of the vagina, lead to the hypogastric glands, at the bifurcation of the common iliacs, and their vasa efferentia proceed to the external iliac glands, which are the continuation of the lympho-glandulæ subinguinales profundæ in the retro-inguinal space of Waldeyer, adjacent to the external iliac arteries and veins. Along the course of the common iliacs are found the inferior lumbar lympho-glandulæ, and lymph vessels pass out from the cervix into the sacro-uterine ligaments, and discharge into the sacral glands. These are situated on the anterior surface of the sacrum, and in the course of the arteria sacralis media. From the sacral glands there is a communication with the common iliac glands. The majority of the lymphatics supplying the body of the uterus at either side form two large vessels which pass outwards along the upper border of the broad ligament. These receive the lymph vessels of the ovary, and, ascending by the ovarian artery, they enter into the median group of lumbar glands, which lie directly in front of the aorta and inferior vena cava, partly surrounding these vessels, and being connected with all the other glands mentioned. The lymphatic vessels from the cornu and Fallopian tube pass out within the round ligaments, and empty into the upper gland of the inguinal groups. The topographical distribution of the lymph vessels and glands is, as has been said, inconstant and by no means regular. Seelig has demonstrated in his inaugural dissertation (Strasburg, 1894), that small lymph vessels receiving the lymph fluid from the larger lymph spaces in the uterus lined with epithelium, empty into other perivascular lymph vessels between the median and other muscular layers of the uterus, anastomosing freely with one another. The carcinomatous cells emanate from the borders of the uterus into the larger lymph vessels above referred to.

Involvement of Nerve Trunks.

Spread of Infection by Nerve Trunks.—Ernst has shown † that cancer attacks adjacent nerve trunks by way of the lymph radicals and lymph spaces of the nerve involving the perineurium, and more particularly the endoneurium, separating the nerve sheath, the cancer cells covering the connective tissue membranes as an epithelial layer, and there proliferating. The endothelial lining of the lymph capillaries is finally destroyed; the nerve trunk proper is separated into numerous bundles by the invading cancer. Ernst injected from the sciatic nerve the entire pelvic lymphatic system as high as the lumbar glands. Cancer also spreads by the vagina or paravaginal tissue, whence it

* *Amer. Gyn.*, 1902.

† *Centralb. f. Gyn.*, 1902, No. 38.

spreads to the connective tissue of the pelvis. Cancer recurrence after operation in three-fourths of all cases occurs in or near the vaginal scar. Mackenrodt's higher percentage of recurrence in the glands was due to the inoperative nature of the cases.

Ries,* remarking on the difficulty of finding carcinoma in the glands, states that he examined 700 sections in one case before he discovered the carcinoma, and he endorses the view that the enlarged glands may not be malignant, and that the ratio between the size of the cancer and that of the affected gland, either in point of numbers or extent of invasion, is uncertain. They are frequently not often discovered until the peritoneum is opened and the large vessels exposed.

Parametric Invasion.—Wakefield,† from his investigations, comes to these conclusions:—(a) That parametric invasion generally precedes the infection of lymph nodes, it being the first tissue involved, and its invasion is not necessarily attended by either palpable or ocular proof of the infiltration. On the other hand, the thickening and induration of the parametrium is no proof of malignant extension. (b) While enlarged lymph nodes are not necessarily cancerous, the context is equally true. The most minute microscopic examination of lymph nodes in serial sections is required before a conclusion is arrived at.

Simple hyperæmia, hyperplasia, secondary infection with pyogenic bacteria, the deposition of cancer elements in the node, are all distinct causes of enlarged and diseased lymph nodes. It has also to be remembered that structures closely resembling those of glands, but differing in their cellular construction, are present. Wakefield does not agree with the view that these embryologic structures arise from abnormal inclusion of parts of the Wölffian body. Where there are no evidences of cancer, these structures were not found. In the same node three distinct stages were found associated with cancer: (1) simple gland-like formations; (2) gland-like structures surrounded by, and partially filled with epithelial masses; (3) purely carcinomatous deposit.

Mary Dixon Jones, in an investigation of cancer of the perimetrium, comments on the absence of all normal epithelial structure, and the presence of columnar epithelium of the adenoid variety. Active proliferation of the epithelia (Virchow) tends to new formations and an inflammatory proliferation, infiltrating the connective tissue with granules and globules adjacent to the cancer nests, there being a gradual reduction of new growth to an embryonal or medullary condition. Inflammatory corpuscles shape themselves into cancer epithelia, and the medullary corpuscles form cancer nests. In fact (Heitzmann), the 'small cellular infiltration' (Fig. 401) is the fore stage of cancer.' Such infiltration is a sure means of prognosis of return of cancer in the spot.

'It is the chief zone of local recurrences after extirpation.' No longer can the presence of cells be regarded as essential to proliferation, and we must seek in the fibrous basis substance for the transformation into protoplasm. In it are generated the cancer epithelia. Further microscopical investigation in this case showed the following points of pathological interest: (1) rows of cancer cells in the lymph vessels, dilated by and carrying these; (2) thrombosis

* *Amer. Jour. Obstet.*, July, 1901.

† *Amer. Jour. Obstet.*, Oct., 1903.

by the cancer epithelia of the true lymph vessels (Fig. 402); secondary changes in the vicinity of the invaded lymphatics; (4) degenerating changes in the lymph vessels, walls, and adjacent connective tissue. Thus, the spreading of the cancer by the lymph vessels is established.

‘Under a power of twelve hundred diameters the cancer nuclei become coarsely granular, undergo division into smaller pieces of protoplasm, or, as some say, there is a “wild evolution of cells.” Thus, the nuclei break up into a number of irregular masses of living matter, each one becoming an active centre of infection. They invade the lining endothelia of the lymph vessels. These endothelia become enlarged, filled with granular matter, and also undergo paracinesis division. Changes take place in the wall of the lymph vessels, they melt away, and the cancer passes into new fields, taking possession of new and larger territories, still growing and spreading. Under the microscope the tissues around the lymph vessel were found filled with cancer epithelia; even the fibrous connective tissue surrounding the thrombus was in a state of active proliferation.

Heterologous Cancer Elements in Pelvic Carcinoma.—The same authority has recorded cases in which different types of malignancy were present in the pelvic tissues, as seen in the accompanying drawings of her sections. Bearing on this point of mixed types of malignant disease occurring in conjunction in the same areas of invasion, the case of a mammary tumour removed by me may be instanced. In some parts the elements were those of scirrhus, in others of adenoma, while the greater portion presented the typical character of cystic sarcoma.

Heterologous Elements occurring in a Case of Carcinoma of the Perimetrium. (M. Dixon Jones.)

It is not necessary to discuss here the theory of Dumaire and others of the coccidial theory of cancer, as it has been shown that these supposed parasitic bodies are secondary formations found in the epithelial tissues, and not psorosperms, as was supposed. It is true that Leopold, with Rosental, found blastomycetes, and with the pure culture obtained they produced, from the testicle of a rat, nodules in the peritoneum; they also got blastomycetes from these nodules, which gave pure cultures.*

Scheurlen’s statement that he has discovered a morphologically distinct cancer bacillus has not been substantiated by subsequent observers, Sanger and Virchow proving that this bacillus grew on potato sections without cancerous origin;† nor were Ballance and

* *La Gynecologie*, Oct., 1900.

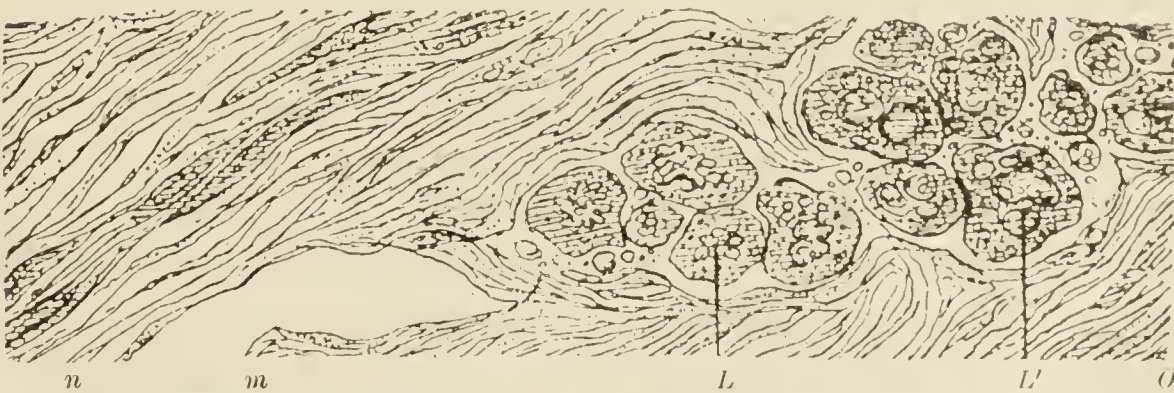
† The researches of Farmer and Moore (page 551) would seem to dispose finally of the bacillus theory.

FIG. 400.—SCIRRHUS AND ADENOID PORTION. ($\times 200$.)

a, Longitudinal bundles of coarse fibrous connective tissue; *b*, small nests of cancer epithelia (the scirrhus portion); *c*, gland-like formations of cancer epithelia, the adenoid portion.

FIG. 401.—ADENOID AND MEDULLARY PORTION. ($\times 200$.)

A, medullary portion of cancer; *B*, adenoid or gland-like formations of cancer epithelia; *C*, so-called small cellular or inflammatory infiltration of fibrous connective tissue; *D*, longitudinal bundles of coarse fibrous connective tissue with formations of nests between the bundles.

FIG. 402.—THROMBOSIS OF LYMPH VESSEL OF LEFT OVARY WITH CANCER EPITHELIA. ($\times 600$.)

O, Fibrous connective tissue of medulla of ovary near hilum; *n*, bundles of smooth muscle fibres; *m*, lymph vessel with unchanged endothelial lining; *L*, cancer epithelia filling and extending the calibre of lymph vessel; *L'*, cancer epithelia whose nuclei show karyokinetic figures.

Shattock, in their experiments with cultivations of the microbe, able to propagate the disease by inoculation.

The Uterine Vascular Supply and Cancer.—Russell of Baltimore has made some valuable researches on the relationship of cancer to the uterine vascular supply and the lymphatic distribution.*

GROUP I.—Uterine artery and branches with the accompanying lymphatics.	Cervix and vagina—upper third.	{ Glands found in the parametrium at broad ligament bases. Glands found at dividing points of iliac vessels.
GROUP II.—Ovarian arteries and branches with its lymphatics.	{ Body of uterus and upper portion of broad ligament.	{ Lumbar glands.
GROUP III.—Vessels of uterine cornu.	{ Round ligament; cornu of uterus.	{ Inguinal glands.

Furieux Jordan thus epitomizes the conclusions to be drawn from Russell's investigations:—

(1) In cancer of the portio vaginalis, if the case be suitable for operative treatment, a wide removal of the vagina is indicated.

(2) If the local extirpation be complete the prognosis is good.

(3) Growths of the cervix are usually adeno-carcinomata and are most malignant. The parametrium should be removed as completely as possible.

(4) Adeno-carcinomata of the body are most accessible to operative procedure and give the most favourable prognosis.

(5) Hysterectomy for cancer of the body should include wide removal of broad ligaments, tubes, ovaries, and round ligaments.

(6) The pelvic glands should be enucleated if possible.

(7) Every precaution should be taken to avoid implanting cancer cells on raw surfaces.

Medullary Cancer.—Dependent upon the relative proportion of connective-tissue elements and epithelial cells contained in its trabecular framework, we describe the cancer as hard or soft. In the medullary cancer there is a preponderance of the epithelial masses of cells, which form plugs in the uterine tissue, under the mucous membrane, invading the areolar elements. This invasion proceeds, both in an outward direction and inwards towards the cavity of the uterus. The areolar structure is compressed by the great growth of cells, which ultimately soften, degenerate, and break down into cancer-juice. This process of cell-proliferation involves, after a time, the vaginal roof, and then begins that peculiar fixation of the uterus so characteristic of malignant disease. This infiltration may extend beyond the vaginal roof, attack the pelvic viscera, and

* *Amer. Jour. Obstet. and Gynecology*, 1896.

reach the lymphatics. For a considerable time the ulceration may not attack the body of the uterus, destroying only the cervix; but ultimately the body of the womb is invaded. This cell-growth leads to death of the areolar tissue, softening, and ulceration.

Meantime the vessels supplying the cervical villi have increased in size; the latter have also become enlarged and hypertrophied. A papillomatous condition is the result. These papillæ, situated on a hardened and infiltrated base, are prone to bleed. Commencing

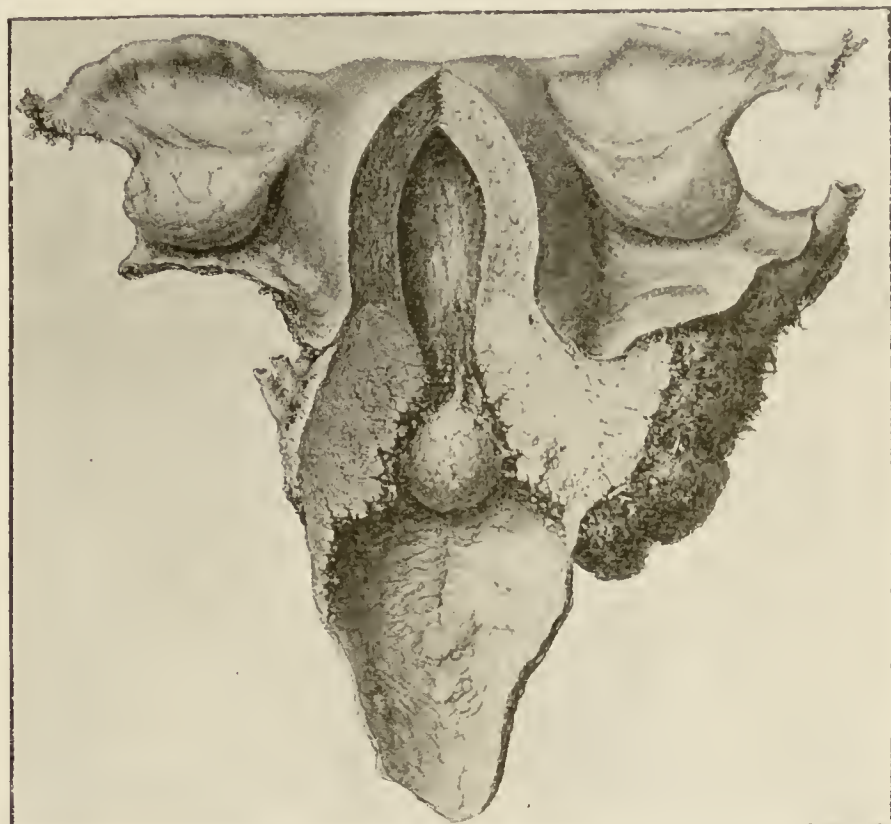


FIG. 403.—ADENO-CARCINOMA OF THE CERVIX WITH HYDROURETER OF BOTH SIDES. (HOWARD KELLY.)

The disease stops abruptly at the junction of the body with the cervix; below, it extends well out into the vaginal vault and the right broad ligament, and involves the entire thickness of the cervix. The right ureter, seen cut across, is converted into a large hydronephrosis. On the left side two ureters are seen, which were also converted into hydronephroses of lesser degree.

as papillary hypertrophy, the malignant type is assumed, and, later on, nests of epithelial cells form plugs in the submucous tissue. Rapid cell-proliferation, great increase in the villi, enlargement of the vessels, and accompanying degeneration and liquefaction of the cells, result in a sprouting or vegetating papillary growth, the *cauliflower excrescence* of the older authors. Grouping together the researches of Klebs, Waldeyer, Virchow, Ruge and Veit, we trace the origin of all cervical malignant growths, either to (a) the cubical epithelium of the cervical glands; (b) the deepest layers of squamous epithelium on the vaginal aspect of the cervix: (c) the

connective tissue cells of cervix ; (*d*) the epithelium of the cervical canal.

Illustrating the importance of careful microscopical examination of the curettings where malignancy of the uterus may be suspected, the following cases are of interest. All three were treated in the same manner. The uterus was thoroughly dilated, the curette

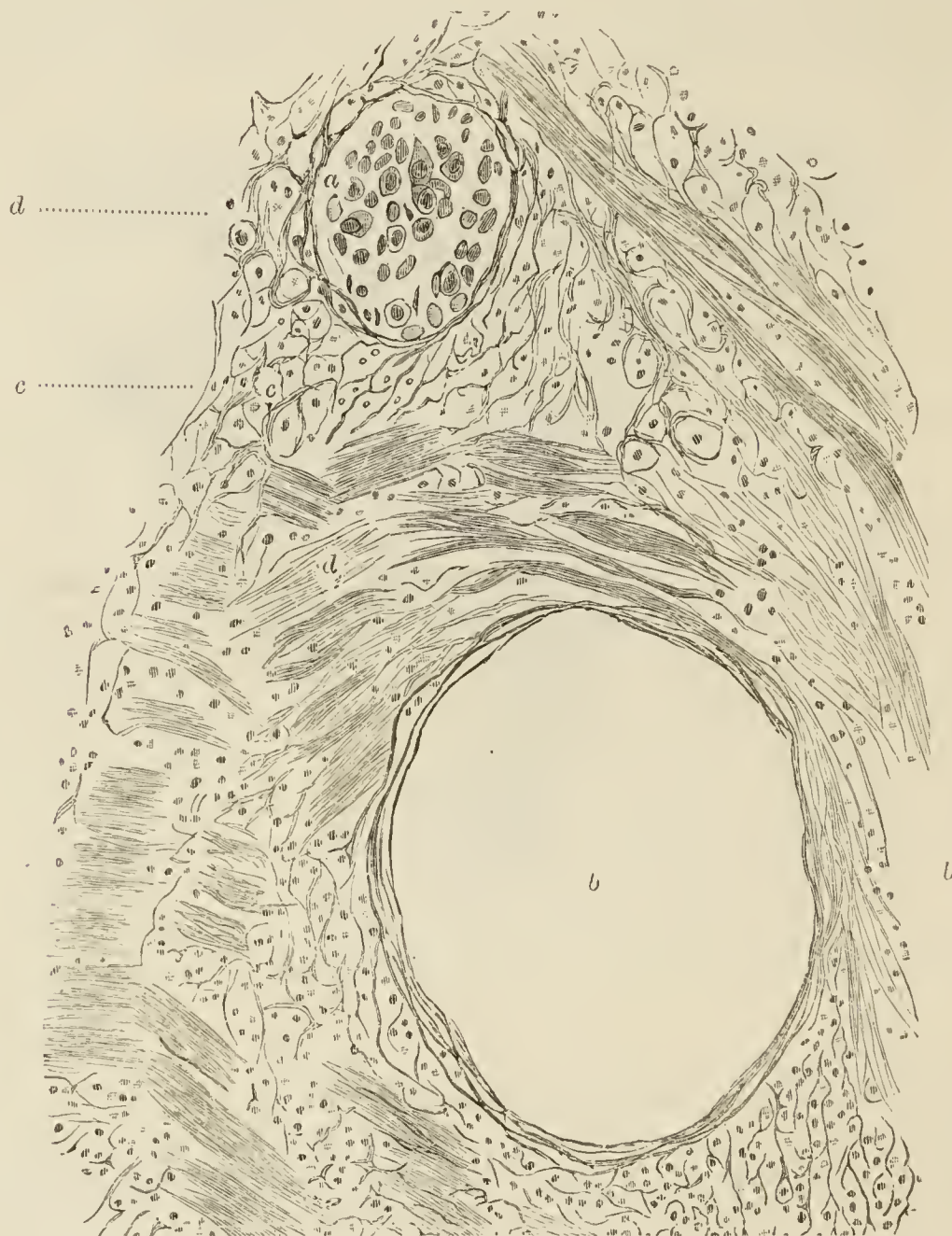


FIG. 404. (AUTHOR.)

a, A collection of round and irregular large and small cells. *b*, Large space, probably vascular; *c*, loose, succulent connective tissue, many of the cells branched, and looking like myxoma cells; *d*, spindle cells and fibres, probably developed from *c*.

freely used, and, when all bleeding was arrested, a solution of chromic acid (3i.—3i.) was applied on the cottonwool holder to the cavity. Periodical applications of carbolized iodine were subsequently made.

A fungoid mass, filling the fundal cavity, was removed with the curette and

Sims' knife, from a patient aged 44, and chromic acid was applied. (Such a case should now be dealt with by pan-hysterectomy.) The section (Fig. 404) shows the microscopical features of the removed mass. Recurrence after a

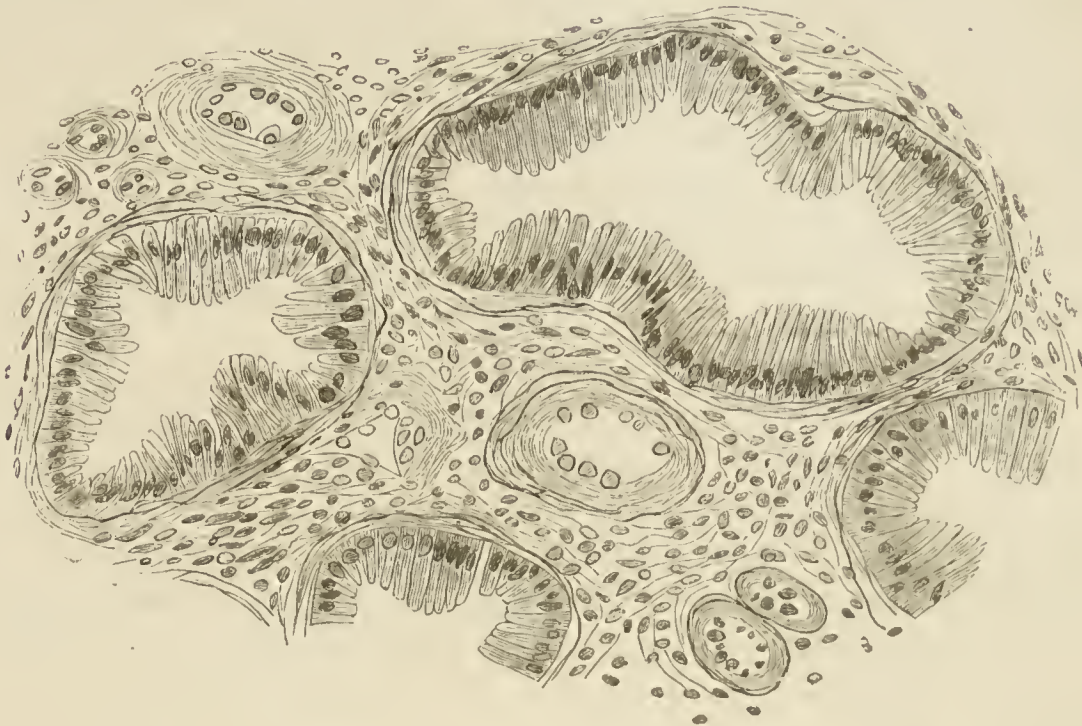


FIG. 405.—MICROSCOPICAL SECTION OF GROWTH REMOVED BY CURETTE.



FIG. 406.—SECTIONS SHOWING GLANDULAR ALVEOLI LINED WITH COLUMNAR EPITHELIUM—MATRIX OF EMBRYONIC CONNECTIVE TISSUE AND BLOOD-VESSELS IN SECTION.

[In the portion figured there is no evidence of epithelial proliferation or encroachment into the surrounding tissue; other parts of the sections, however, show these conditions—*i.e.* an approach to epithelioma.]*

period of quiescence took place, and the same treatment was again adopted. The disease soon involved the entire cervix and the vaginal roof. Death occurred in about eighteen months from the date of the curettage.

* Phineas Abraham furnished the pathological report on these sections.

deposits of a similar character were found in both tubes and ovaries. Such cases are extremely rare.

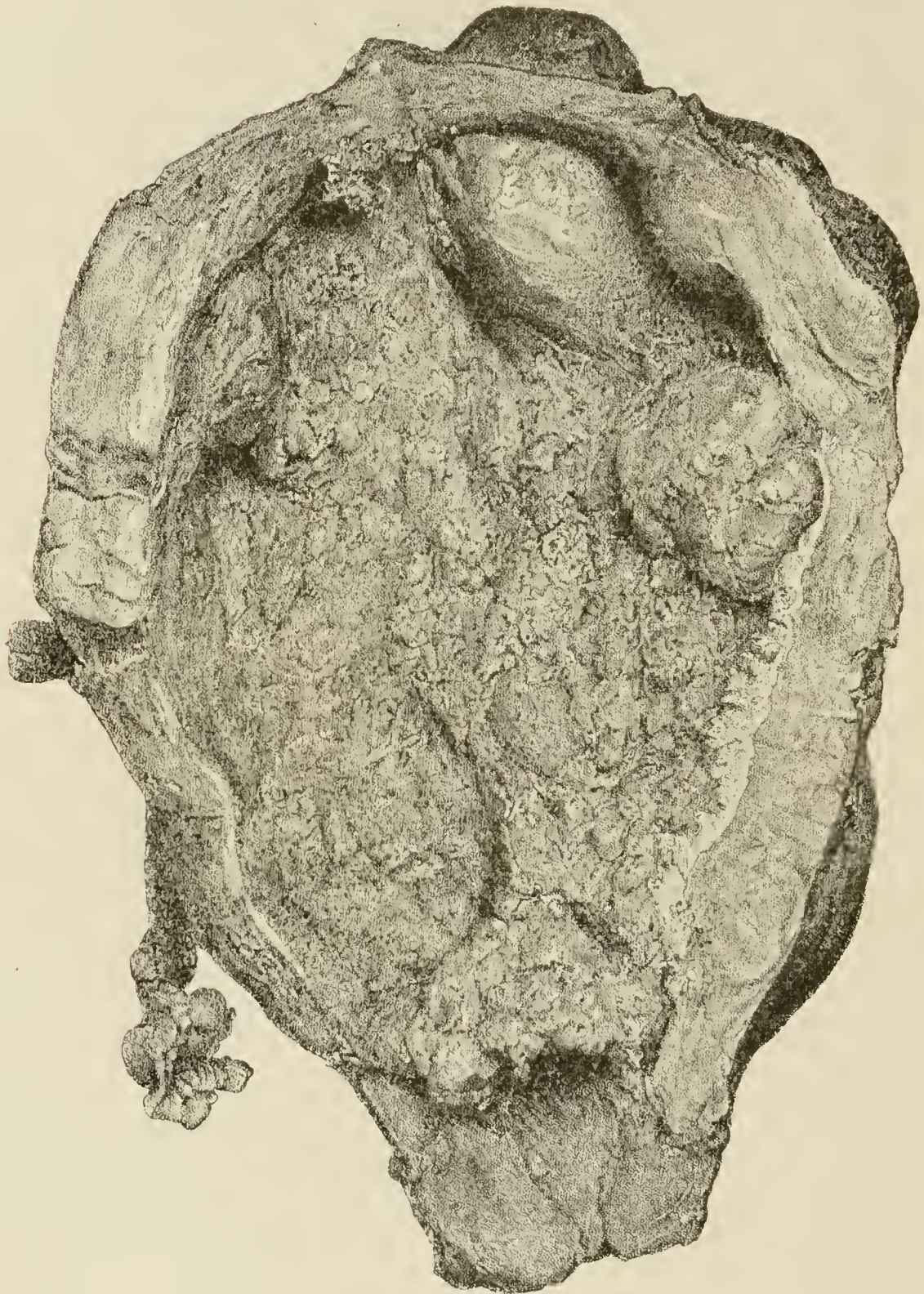


FIG. 407.—CARCINOMA PSAMMOSUM. (SCHMIT.)

Hitschmann* asserts that metaplasia from cylindrical epithelium into squamous occurs frequently in carcinoma of the body, and that the glandular epithelium passes into the squamous form. Squamous epithelium may thus undergo corneous metamorphosis, and when hyaline degeneration takes place, the change into carcinoma psammomum occurs (Fig. 407).

I have only personally followed the stages of one case in which pre-existing

* *Archiv. f. Gyn.*, bd. lxxix., heft 3, p. 628, 1903.

cervicitis, whether catarrhal or granular, gradually passed into malignant disease of the uterus. I have frequently met with cases in which I have been told that this has occurred, but the diagnosis of malignancy has been clear on my seeing the patient. The existence of follicular hypertrophy of the neck in multiparæ, and its persistence after the menopause, is the condition I specially fear among the premonitory or predisposing conditions. Such follicular conditions I have seen terminate in carcinoma. The presence of lacerations of the cervix in some cases may be fairly looked on as a mere coincidence of the multiparous uterus; the strongest pre-disposing cause unquestionably is repeated pregnancies. Race seems to exert considerable influence, judging from the comparative but by no means complete immunity of the negro races.

Examination of the Uterus after Pregnancy.

American authorities insist on the importance of making an examination periodically after confinement, so as to note the appearance of any lesions that may have followed labour. Kelly advises that every woman over thirty-five years of age with a laceration should be yearly examined with this object, and Stone advises that all women in whom we have reason to suspect, through heredity or otherwise, the occurrence of cancer should likewise be examined. [This subject has already been referred to in the chapter on laceration of the cervix.]

Clinical Differentiation.—The clinical distinction of canceroid and carcinoma may be found in the comparatively slow progress of the



FIG. 408.—SURFACE OF CERVIX, SHOWING EPITHELIAL INGROWING. (AUTHOR.)
(High amputation—death fifteen months subsequently.*)

* ‘The growth is a typical example of epithelioma, anastomosing prolongations,

cancroid or epithelioma, the more superficial situation of the latter disease in the early stage, and its spreading character. Carcinoma is more rapid in its progress, and affects by metastasis the pelvic and lumbar glands and distant organs, as the lungs and liver. The 'rodent,' or 'corroding,' ulcer of Clark is a rare form of malignant ulceration. Extensive ulceration is the main feature, often continuing for years before death occurs. The 'cauliflower excre-

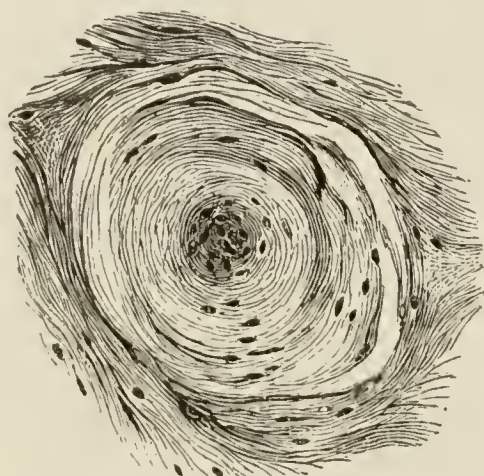


FIG. 409.—TRUE 'NEST.'
(Same specimen.)
a, FIG. 408.

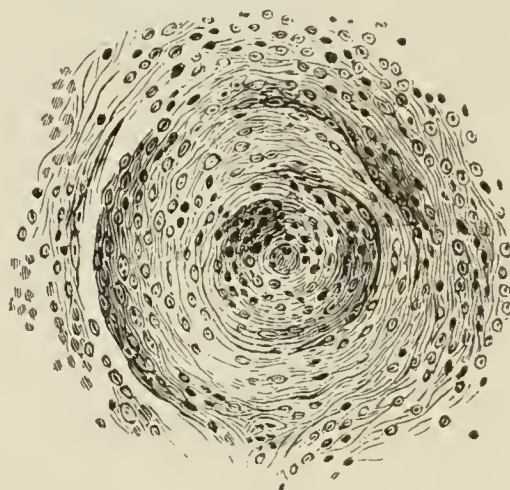


FIG. 410.—FASCICULATED CON-
NECTED TISSUE.
(Same specimen.)

scence,' or malignant vegetating papilloma, has been already briefly referred to. While the differentiation, clinically, of the different forms of epithelial cancer becomes almost impossible when the disease has lasted for any time, and ulceration has extended widely and deeply, the distinctive characters of *scirrhus*, in its slow progress, the hard and nodular nature of the growth, and the small discharge that attends its earlier stages, are quite apparent.

"tubular" and irregular, extending from the surface epithelium of the os into the subjacent tissue (Fig. 408). In several of these epithelial encroachments, centripetal collections of young cells—the so-called "nests"—are formed (Fig. 410), or in process of forming. In some of these the central (newest) cells are very large, succulent, and rapidly dividing. In the tissues—fibrous and muscular—which surround the heterogeneous epithelial ingrowths, the usual small-celled inflammatory infiltration characteristic of these malignant growths is evident in several places.' (Abraham.)

CHAPTER XXXI.

CANCER OF THE UTERUS (continued).

Cancer of the Portio Vaginalis, Cervix, and Body—Sarcoma.

Symptoms and Physical Signs.—Cancer of the portio and cervix uteri has, as a rule, four symptoms, so characteristic that it is well to group these in the first place together. They are—

Pain ;
Hæmorrhage ;
Fœtid discharge ;
General cachexia.

The first and ever-to-be-remembered clinical fact connected with the symptomatology of malignant disease of the uterus, which it is right for the practitioner to keep always in mind, is, that *cancer of the womb, whether of cervix or body, may exist for a considerable time, and many or all of its characteristic symptoms remain in abeyance*. It is not uncommon to see extensive inoperable carcinoma of the cervix where the first thing complained of is hæmorrhage. This leads to an examination, and the cancer is then discovered.

Cases are constantly seen in which no pain is complained of, and where the patients first seek advice when it is too late to propose any operative measure, the peri-uterine structures and Douglas' pouch being involved. In the same way some patients suffer from what they believe to be leucorrhœal discharge. They pay little attention to this, treating it as 'whites,' and seek no advice, or they are not examined until the cervical tissues are deeply fissured and the malignant change has commenced.

Pain.—The pain of cancer is generally of a burning or lancinating nature, and is especially felt at night. Occasionally coitus is painful in the early stages of the disease, and the uterus is sensitive. At other times intercourse gives rise to no pain. As the disease spreads to the vagina the pain is increased, and is more aggravated, being felt with the movements of the bladder and rectum, and preventing sleep. It is often concentrated in the sacral region, and travels in the course of the sacral nerves, and extends down the backs of the

thighs. Later still, it becomes intolerable, and the patient craves for morphia and sedative injections.

Hæmorrhage.—In the earlier stages of the disease, this is the most frequent symptom. At first, it may be simple menorrhagia. The menstrual flow is increased. Perhaps there is some slight bleeding with intercourse. After a time it becomes metrorrhagic in character, and there is either a constant or periodic discharge. We may be suspicious of malignancy should the cervix bleed readily on exami-

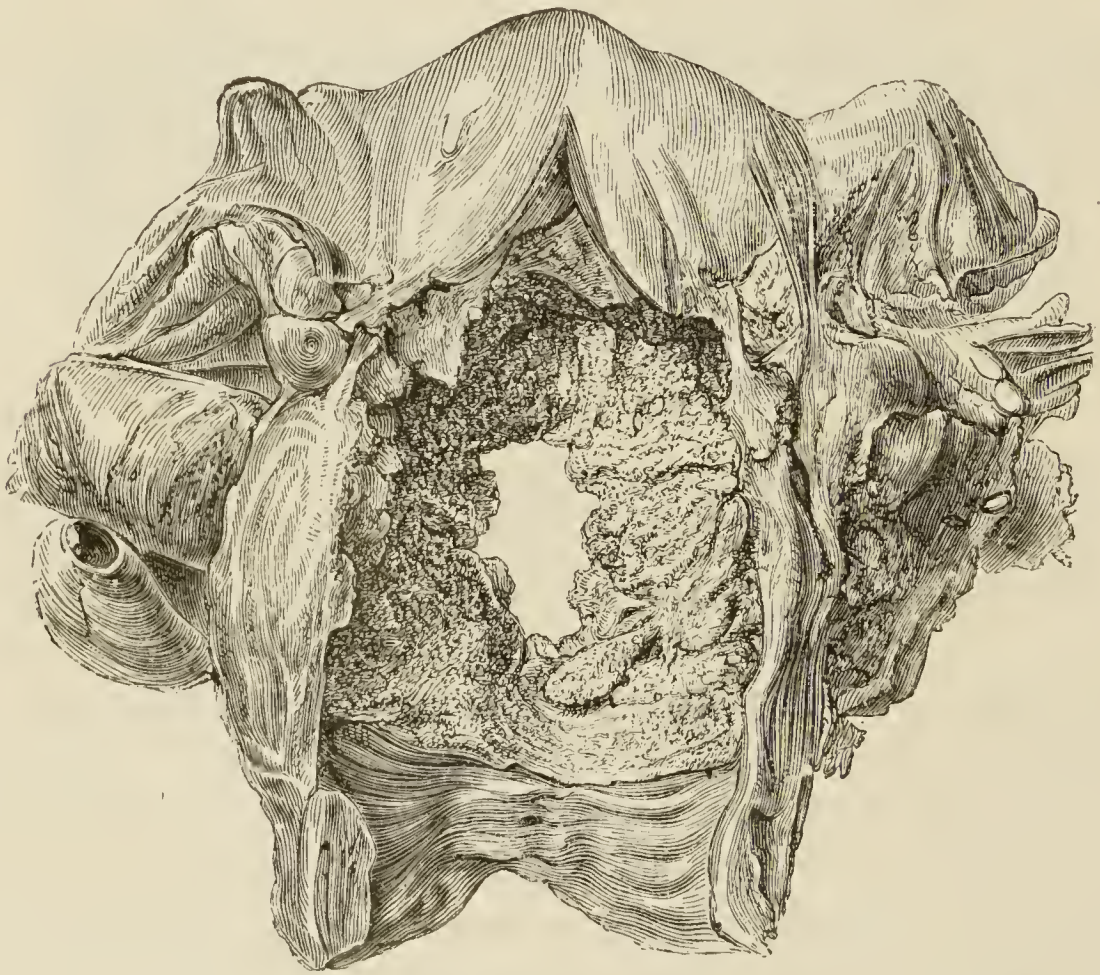


FIG. 411.—CANCER EATING AWAY THE LOWER HALF OF THE UTERUS, AND PERFORATING INTO THE BLADDER. (ROBERT BARNES.)

Half-size; St. Thomas's Museum.

nation, and when there is no erosion to explain this; also, if the cervix be congested, the veins somewhat engorged, and the lips of the os have a glazed and semi-everted look. The half-watery, partly bloody, somewhat foetid and erratic nature of the discharge, in the earlier stages of malignant disease, is always sufficient in itself to arouse suspicion. Still, the tendency to menorrhagia may be the symptom most urgently demanding attention, and there is no rule more absolute in gynaecology than this—in all cases of persistent menorrhagia or metrorrhagia inquire carefully into its cause, and accept no responsibility for the consequences unless a vaginal examination be permitted.

Fœtid Discharge.—It may be laid down as a safe rule in gynæcological practice—polypus, and conditions arising out of pregnancy being excluded—that if there be hæmorrhage with fœtor, we should suspect the presence of malignant disease. The fœtor arising from the putrescence of the disintegrating and necrosed uterine tissue we may look on as the most invariable accompaniment of cancer of the womb. The patient herself soon becomes aware of the odour. In the final stages of the disease, if not controlled, it pervades her clothes, and the room in which she is confined. This fœtor, however, is not by any means an invariable accompaniment ; especially in cases where hæmorrhage is present, and the necrosed particles are washed away with the discharge of blood.

Complication of the Urinary Organs.—Frequently there are most distressing

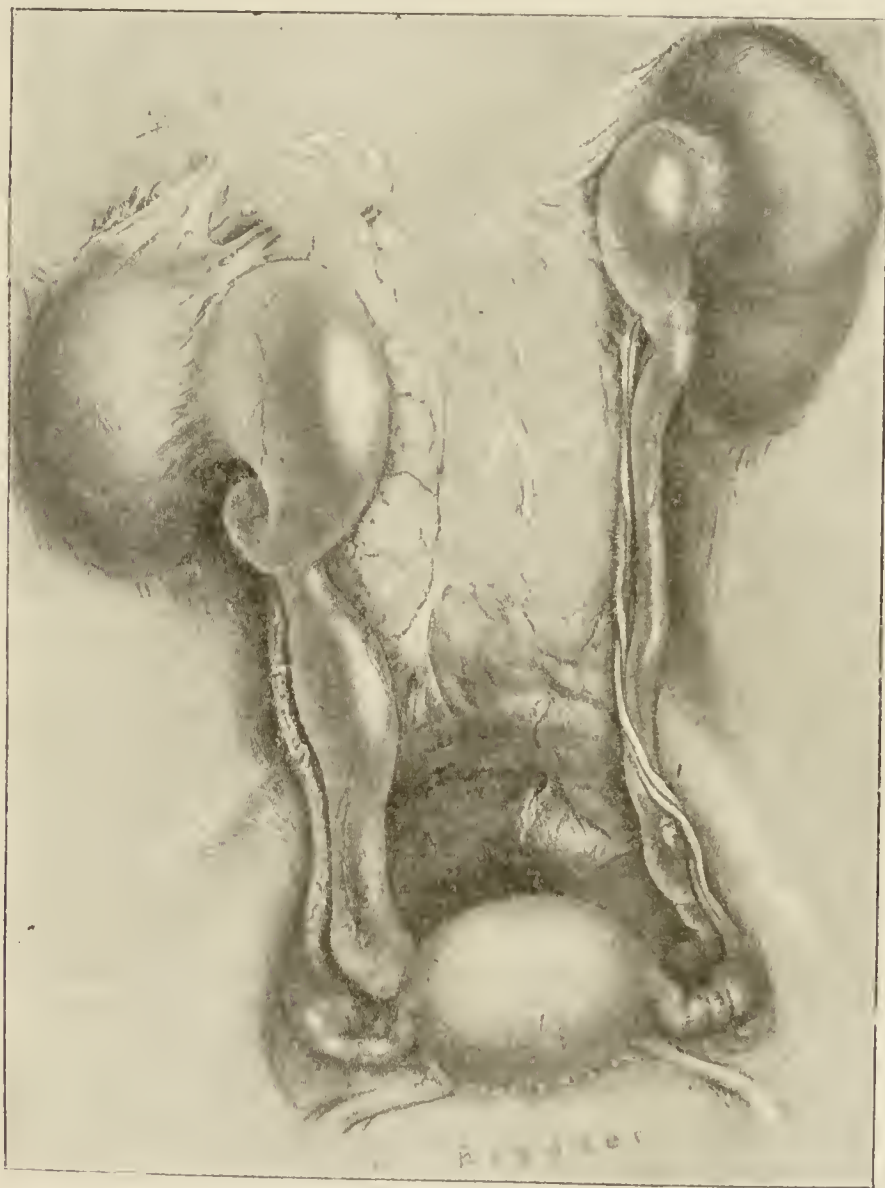


FIG. 412.—DOUBLE HYDRO-URETER DUE TO ADVANCED CANCER OF THE UTERUS. (H. KELLY.) *

Adhesions connected the uterus to the bladder, also the ureters, and there was cicatricial tissue between the latter and about the kidneys.

* See also chapter on Ureters.

renal and vesical symptoms, which are due to involvement of the ureters and bladder in the disease. The former may be ulcerated or distended through obstruction at their lower ends. McClintock was the first who drew attention to the occasional termination of the disease by uræmic poisoning from nephritic changes. Such renal changes consist, according to Strauss and Germont, in alterations in the papillæ and the pyramids. The former are flattened and irregular, while later on the secretory tissue of the kidney is destroyed, its place being taken by a fibrous membrane. If the bladder be engaged in the disease, the extension of mischief to the ureter and kidney is generally of a rapid character, and is rarely followed by pyonephritis, the renal consequences being due rather to the obstruction of the ureters with resulting hydrups ureteri.

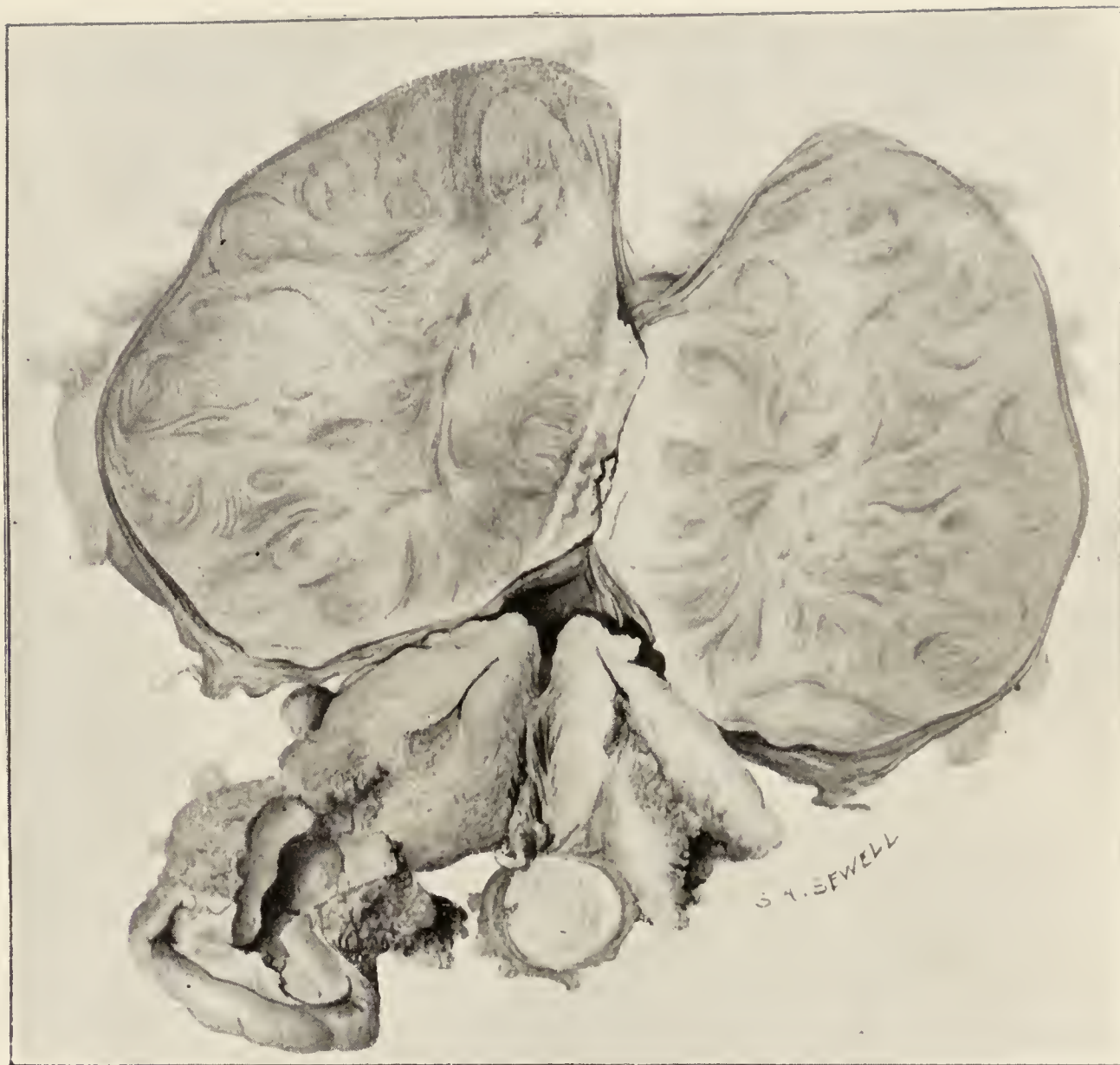
General Cachexia.—Sooner or later the involvement of the system in the affection, brought about by the pain, sleeplessness, anxiety, pelvic visceral trouble, loss of blood, and constant discharge, manifests itself. There is general emaciation, and the face has the anxious, painful, and worn expression common to cancer elsewhere. In protracted cases there is a discoloured, almost icteric, tint.

Other Physical Signs.—As uterine cancer progresses, the general clinical features will depend to a great extent upon the degree to which other parts or organs are involved, and the accidental complications that may arise. The rectum and bladder, the ureters, the pelvic and general peritoneum, the pelvic veins, and lymphatics, may each in turn be attacked. Septicæmia, peritonitis, phlebitis, or pneumonia may follow.

In the early stage there is not much to rely on as distinctive of malignancy. The hardness of the cervix, or the increased sensitiveness and slight hæmorrhage, are not in themselves sufficient to justify any positive decision. But the local conditions after a time leave little room for doubt. The soft and friable cervix, with the everted and hardened rim of cervical tissue; the proneness to hæmorrhage even on a slight examination with the finger; the detection of fœtor; the fixed uterus; its ragged and excavated appearance, or the presence of a vegetating, fungus-like and bleeding mass, seen with the speculum, are not, with any exercise of care, to be mistaken for laceration, erosion, areolar hyperplasia, or sloughing polypus. If the bladder and rectum be involved, the distress becomes great, and the woman's release from suffering and misery is only to be found in death.

Among the later symptoms of carcinoma of the uterus are those due to involvement of the rectum. Pain and tenesmus are not infrequent attendants, and there is often a certain degree of proctitis

PLATE XLII.



MYOMA COMPLICATED WITH CARCINOMA. (AUTHOR.)

The fibro-myoma was the size of a foetal skull at term. It was removed from a spinster, aged 58, by vaginal hysterectomy. *Pathological Report*: The specimen consisted of three portions; the largest was an oval intramural fibroid, 5 ins. in its chief diameter, projecting from the back of the uterus near the fundus. The lower segment of the uterus was invaded by a soft white growth, a columnar-celled carcinoma, with solid branching columns of epithelium. Below this was a small fibroid distinct from the carcinomatous portion, and not infiltrated by it. The third part consisted of the cervix uteri, and adjacent portions of the vagina. The os uteri, the internal surface of the cervix uteri, as far as the internal os, were normal, though there was much inflammatory infiltration between the bundles of muscle fibres. The patient made a good recovery from the operation, survived twelve months, and died, as I learned, from some acute attack of bowel obstruction, doubtless of a malignant nature. (See pp. 406 *et seq.*)

[To face p. 570.]



present. These symptoms are associated with constipation and difficulty in defæcation. They may be present long before the coats of the rectum are invaded to such an extent as to produce a fistula.

When the disease has extended so far as to include the larger pelvic veins, these are compressed, or the infiltration blocks their lumen so that thrombosis follows, and an œdematous condition of the lower extremities is a consequence. As pointed out by Cumston,* death does not frequently follow from sepsis, nor from hæmorrhage. This is due to the incapacity of the lymphatic vessels to absorb the septic products within the area of the disease, and the blockage of the infiltration thrombosis in the neoplastic area. The affected parts may be said to be encapsulated. Death from peritonitis is not uncommon, from extension of the malignant invasion to the peritoneal surfaces of the bowel and parietes.

In all instances where, early in the disease, a doubt exists between a benign and malignant condition, the microscope should be brought to our aid, and a small portion removed and carefully prepared for examination. When we suspect malignant disease of the body of the uterus, where the curette is used, not only should we get a portion removed rather deeply and extending into the parenchyma, but of equal importance is it to get particles from two or three different situations. The typical appearances of the stroma, alveolar spaces, and nucleated cell, will enable us fairly to decide as to the malignancy or otherwise of a growth. Yet this test, should the result be a negative one, must ever be looked on as only one of the several proofs of malignancy, as it is often difficult to obtain sufficient tissue to enable us to exclude the possibility of malignant infiltration.

Differential Diagnosis.—There are some pathological conditions of the cervix and portio that frequently cause doubt as to the cancerous nature of the affection. These are—

Laceration, with erosion and granular degeneration of the cervix.

Benign papillomatous growths.

Hyperplasia of cervix.

Sarcoma.

Syphilitic ulceration.

Follicular hypertrophy.

Polypus of the cervix.

Intra-uterine sloughing fibroid.

Our diagnosis must depend on these clinical facts:—

1. The comparatively rapid progress of the symptoms.
2. The absence of other proofs of syphilis.
3. The age of the patient, and the family history.

* *Ann. Gyn. and Ped.*, March, 1902.

4. The presence of the characteristic symptoms and signs of malignancy : especially—pain, hæmorrhage, ichorous leucorrhœa, fœtor, rectal distress, and pain on defæcation.
5. Immobility of the mucous membrane on the subjacent tissue—early in the disease (Waldeyer)—and fixation of the uterus. Later on, the resistance of the cervical canal to the action of a sponge-tent (Spiegelberg).
6. The involvement of the adjacent vaginal wall.
7. Persistency of the local signs notwithstanding treatment.
8. The appearance of the patient, and evidence of increasing cachexia.
9. The condition of the cervix, as felt with the finger and seen through the speculum.
10. Evidence of metastasis, and of malignant growths elsewhere.
11. The microscopic appearances.

Early Local Signs.—Stratz has drawn special attention to the colour of the excoriated surface early in the disease :—

- (a) A yellowish-red granular surface ;
- (b) A slight yellowish discoloration ;
- (c) Yellowish-white, glistening, granular bodies over the surface of the cervix.

I have frequently noticed this discoloration in cases of threatening cancer, as also the dark-red swollen proliferation of one lip, pretty sharply defined and somewhat elevated, described by Stratz. The vaginal mucous membrane appears also to partake of this process of discoloration and infiltration ; it assumes a yellowish or mottled look, and has rather a smooth leather-like surface and feel.

Carcinoma of the Body of the Uterus.—There are important reasons for studying the signs of cancer of the body of the uterus apart from that of the cervix. We may epitomize these as follows :—

1. It is not so common as cancer of the cervix.
2. It is a disease of more advanced life, generally occurring during or after the menopause.
3. It is found more frequently in nulliparous women.
4. Histologically it is more allied to sarcoma or adenoma.
5. The symptoms are more obscure than in malignant disease of the cervix.
6. The body of the uterus is the part affected, the cervix being comparatively free : the body may be enlarged, or hollowed out, and filled with the cancerous mass : or the parenchyma may be the part principally involved.

PLATE XLIII.



CANCER OF THE FUNDUS—CERVIX FREE FROM DISEASE—UTERUS AND ADNEXA REMOVED BY AUTHOR BY BUMM'S OPERATION.
[To face p. 572.]

PLATE XLIV.



CURRETTINGS FROM FUNDUS REMOVED BEFORE OPERATION.

[*To face p. 573.*

Abel first proved that the corporeal endometrium is much more frequently affected in cervical carcinoma than had been believed, and he found that the change more frequently took on the form of round or spindle-celled sarcoma.

Cancer of the Body.

—Commencing either in the epithelium of the uterine glands, in the parenchyma, or in the connective tissue, general thickening of the mucous membrane with disintegration and discharge follows, or scattered nodular deposits are formed, or a diffused infiltration occurs. Perforation of the uterus may ultimately follow, and an opening into either the bowel or bladder result, or this may be prevented by adhesions.

Diagnosis.—When any patient, over forty years of age, presents herself complaining of pain, intermittent hæmorrhage, fætid discharge of a watery nature, at times coloured, and especially if these symptoms make their appearance after the menopause, and where menstruation has ceased for some time, cancer of the body of the womb

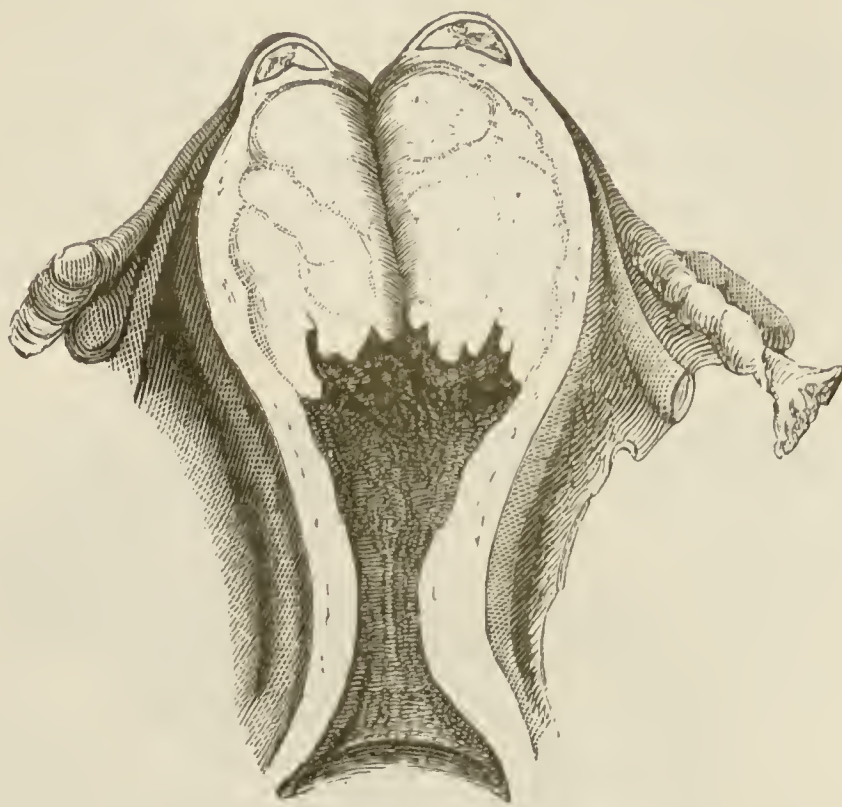


FIG. 413.—CANCER OF THE BODY ASSUMING THE APPEARANCE OF A SUBMUCOUS FIBROID. (RÜGE AND VEIT.)



FIG. 414.—CARCINOMA OF THE CERVIX. (JESSETT.)

Drawing from specimen in Cancer Hospital Museum.

should be suspected. If on digital examination the cervix be found healthy and the fundus enlarged, and that with the uterine probe some foul-smelling and discoloured discharge can be wiped from the cervix, the latter should be dilated, the cavity of the uterus explored, and the spoon curette used to remove two or three portions of the endometrium and subjacent tissue for microscopical examination. Such microscopical examination will enable the surgeon to decide as between cancer, *adenoma*, a *sloughing intra-uterine fibroid*,

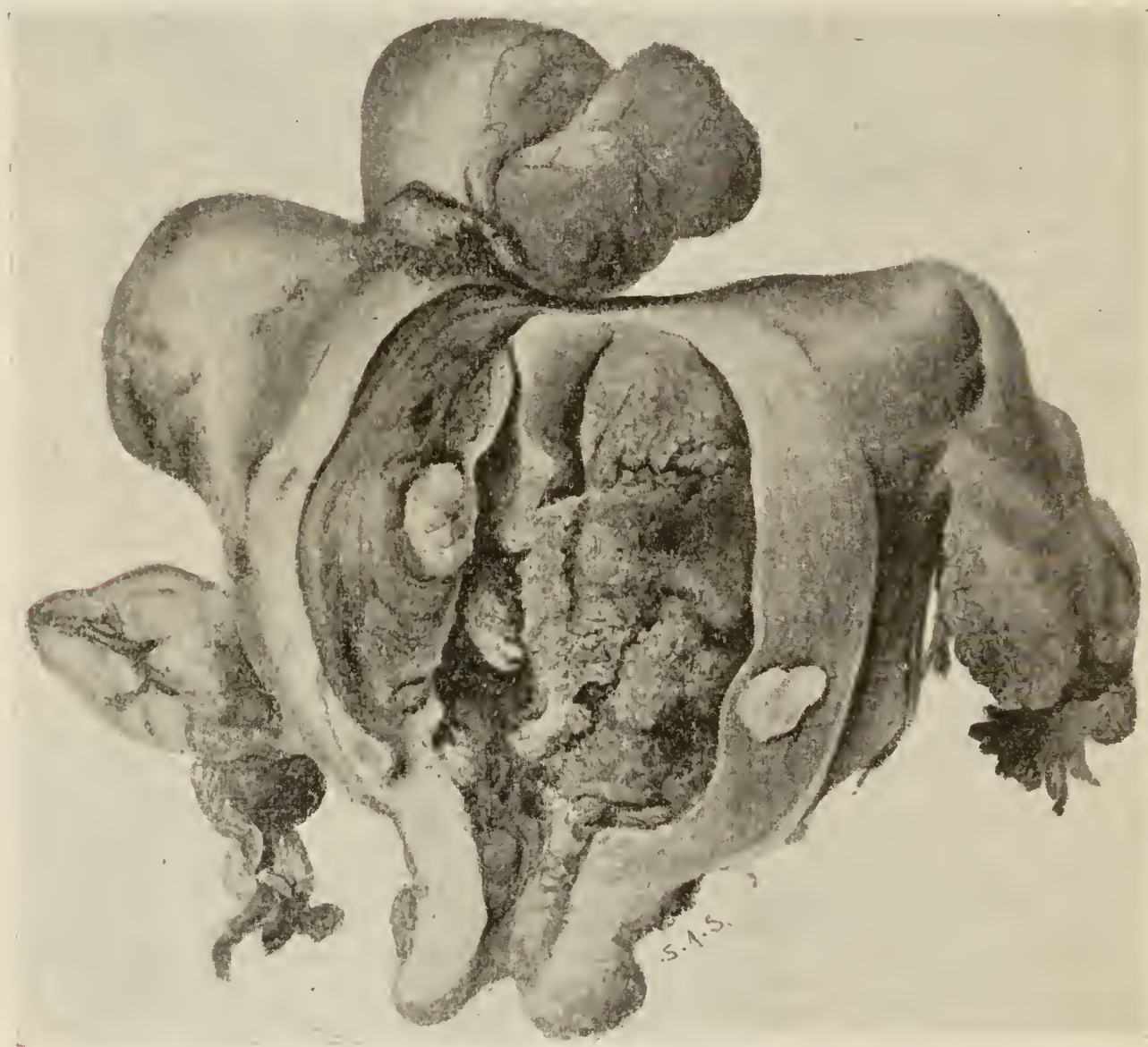


FIG. 415.—CARCINOMA OF THE BODY OF THE UTERUS. (JESSETT.)

Drawing from specimen in Cancer Hospital Museum.

polypus, '*fungous endometritis*,' and *products of conception*. Should the symptoms arise during the child-bearing period of life, the probability of these latter being the cause must not be lost sight of. If the cavity of the uterus be carefully explored and found enlarged, or any soft mass which bleeds readily and imparts a foul odour to the finger be protruding into it, and if, in addition, the uterus be fixed by adhesion, and there be accompanying cachexia, even without microscopical examination the opinion will be on the side of malignancy.

The microscope will dissipate any doubt that remains, and this should *always* be made the final test.

Differentiation of Fungous Endometritis.—Heitzmann (New York), commenting on the fact that it is extremely difficult to diagnose accurately such conditions as polypoid growths, sarcoma and papilloma of the mucosa, adenoma, and carcinoma, from fungous endometritis, from repeated microscopical examinations draws these distinctions :—

‘**Endometritis Fungosa** is characterized under the microscope by the presence of a varying number of tubular utricular glands, the epithelia of which are columnar, ciliated, but always unbroken. The connective tissue between the tubular glands may be crowded with lymph-corpuscles, exhibiting a hyperplasia of the adenoid or lymph-tissue of the uterine mucosa, or the interstitial tissue between the tubules is found to be myxomatous, or even fibrous, in nature. These differences probably depend on the age of the patient.

‘**Polypoid Tumours** consist of myxomatous tissue, and are properly termed myxomata; or if bundles of a delicate fibrous connective tissue enter the structure, fibro-myxomata. Glandular formations in such tumours are, as a rule, scant or absent; they not infrequently contain cysts.

‘**Sarcoma**—especially in its earlier stages—occurs under the clinical symptoms of fungous endometritis, mostly diffused; and the correct diagnosis can be made with the microscope only when the epithelia of the tubular glands, either the original or newly-formed, are destroyed by the sarcomatous growth.

‘In sarcoma the epithelia of the utricular glands are transformed into sarcoma corpuscles, either directly by a process of division, or through the intervening stage of a coalescence into granular protoplasmic masses.

‘**Papilloma of the Uterine Mucosa** does occur in exactly the same way as on the mucosa of the urinary bladder. This form of tumour is extremely rare.

‘**Adenoma** is a rare form of tumour, sometimes appearing under the clinical features of fungous endometritis. It consists of a new growth of the utricular glands in a plexiform arrangement with narrow calibres. The connective tissue between the epithelial formations is fibrous and scanty.

‘**Cancer** appears in the uterine mucosa in the form of epithelioma and medullary cancer. The utricular glands are not directly formed into cancer nests, but their epithelia first breaks up into medullary corpuscles, or into larger masses of protoplasm, from which the cancer epithelia arise.’

SARCOMA.

Compared with carcinoma of the cervix, sarcoma is comparatively rare, probably not one case in twenty of malignant disease of the internal genitalia proving to be of the sarcomatous nature. In the body of the uterus, however, it is relatively more frequent, about

half of the cases of malignant disease of the corpus being sarcoma. It is recognized, pathologically and clinically, as occurring in two principal forms, according to the structure in which it arises. This may be either in the *parenchyma* of the uterus or its *mucous membrane*—from the latter rarely. In the former case it is of a more isolated character, and the nature of the growth will depend upon its *subperitoneal*, *interstitial*, or *submucous* situation. The submucous and subperitoneal project on the surface or into the cavity of the uterus in the direction of least resistance, while the interstitial are disseminated in the tissue of the wall of the body of the uterus. Such submucous sarcomata occasionally have had an origin in a polypus. Those sarcomatous growths which spring from the connective tissue of the endometrium usually take the form of papillary growths upon its surface, frequently, however, infiltrating the mucous membrane and involving the uterine parietes as far as its peritoneal coat. Thus, certain soft sarcomata may become attached to the adjacent viscera, or project as soft fungus-like masses into the uterine cavity. There is a feature in regard to sarcoma of the female genitalia which must be remembered. It often takes on the pedunculated form, both in the uterus and in the vagina. It is not often of the irregular granular type which is assumed by carcinoma. That a fibromyomatous tumour may, as we have seen, degenerate into a sarcoma is now an acknowledged fact. In a multiparous woman at the period of the menopause such a change is more likely to occur. From what has been already stated of the generation of cancer epithelia in connective tissue, we are prepared for the actual development of sarcoma from the same elements.

Roger Williams* classifies the various uterine sarcomata under five heads—(1) Infantile; (2) grape-like, or botryoidal; (3) sarcoma of the mucosa; (4) sarcoma of the parenchyma; (5) deciduoma malignum. Showing the comparative rarity of sarcoma, he mentions the fact that, of 6754 cases of uterine neoplasms, only ten were instances of this. As I have said, however, this must be regarded as far too low an estimate.

Ages—Sarcoma in Children.—Some interesting cases of children affected by sarcoma have been recorded, one at seven months old, and at nine months utero-vaginal extirpation by the sacral way was carried out, the child making a good recovery (Hollander). In C. T. Smith's case, the child was three years and nine months old. It was found to be a round cell sarcoma. Other cases are recorded at four months (Ahfeld), thirteen months (Farnsworth), and two years (Pick).

Williams considers that many of the malignant tumours of infancy and

* *Brit. Gyn. Jour.*, May, 1897.

early life are wrongly named cancerous from the epithelial elements they contain. They are in reality sarcomata. The grape-like pedunculated masses which resemble hydatid moles, and are soft and easily detachable, he regards as highly malignant, being of heterotopic constitution—striped muscle, cartilage, bone and epithelial elements, ‘sequestered from the matrix of adjacent tissues during early embryonic life.’

Such growths are in some instances papillary, or of a compound sarcomatous character (‘adeno-myxoma-sarcoma,’ ‘myo-sarcoma-strio-cellulaire,’ ‘myxoma enchondromatodes arborescens,’ ‘fibroma papillare cartilagineum’). The commonest forms of uterine sarcoma Williams considers to be those of the mucosa, and it is important to note that in the sarcomata of children, as in those of the mucosa, there is in many cases a production of numerous softish round polypoid bosses, and in young patients sarcomata may present themselves as polypoid tumours springing from the inferior segment of the uterus. Further, the infiltration may, as in the case reported by Simpson, spread along the Fallopian tubes to their fimbriated extremities. Mucosal sarcomata assume a large size in the fundus uteri, otherwise they are apt to become polypoid. They are rich in blood vessels, and consist mainly of small round spindle cells, held together by a scanty fibrous matrix. Recurrence and dissemination are apt to occur. Glandular elements, as reported by Kay and Schmit, are sometimes intermixed with the sarcomatous new formation; and other authorities, as Johnston and Hackeling, have recorded the same intermixture. Parenchymatous sarcoma is, as a rule, more circumscribed than the other varieties, and may put on the telangiectasic type (Aslanian); and Webster has recorded a case of angio-sarcoma, a unilocular blood cyst of the uterine wall, in a patient aged fifty-three. I have already alluded to the transition of fibromyomata into sarcomata (Virchow, Rokitansky, Schröder).

The sarcomata may, however, also arise from the parenchymatous elements, particularly its peri-vascular and lymphatic. Williams says, ‘In the structure of these sarcomata round and spindle cell forms predominate, but myeloid elements have often been noticed. Fibrous tissue, organic muscle cells, blood-vessels, and lymphatics are also among their usual constituents. Myomatous and oedematous modifications are fairly common. In the soft, shiny, grape-like, easily detachable masses of the neoplasm we may recognize the racemose sarcomata, but the microscope alone must be the court of appeal in most cases.’

Symptomatology.—If we contrast the symptoms of the fibro-sarcomata with those attendant upon the diffuse variety, we find that hæmorrhage is present in both, perhaps more profuse in the latter. Semi-sanious watery discharges periodically occur in the two, but when the disease attacks the mucous membrane particles of necrotic tissue are washed away by the discharge, and are found in it. Severe pain accompanies both the parenchymatous and sub-mucous forms. That of the interstitial growth, however, is more periodical, of an expulsive, ‘bearing-down’ character, and associated with hæmorrhage. Such pains and erratic discharges are consequently apt to be, and, as a matter of fact, often are, interpreted as

menorrhagic or metrorrhagic losses associated with the menopause. There is this striking difference between the two types of disease: in the interstitial form the uterus is greatly enlarged, and frequently its canal is so dilated that we may explore and reach the intra-uterine growths with the finger. In the diffuse variety, on the other hand, though the uterus is increased in size, and possibly immovable, there is no defined tumour felt in it from without. Other symptoms in each case will depend upon the rapidity of the extension of the disease, and the degree of involvement of neighbouring parts in the pelvis, though more remote organs, such as the lungs and liver, may be affected by metastasis. The ultimate fatal issue does not differ from the corresponding termination of a case of diffuse carcinoma of the uterus, when extension has taken place to the structures surrounding it. Indeed, the course and progress of the two diseases is so alike that it is often impossible to distinguish them. Microscopic examination of portions of growth removed by the curette or finger-nail is the only means of arriving at a correct conclusion. There is in sarcoma, especially in its later stages, the same cachetic condition that we have in carcinoma. On examination of a uterus, the hæmorrhage from which renders us anxious, and from which the possible presence of products of conception is excluded, should we see an irregular, soft, reddish-coloured mass protruding from the os uteri or filling its calibre, and readily bleeding, we should suspect sarcoma and bring the microscope to our aid to confirm the diagnosis.

Differentiation.—The more frequent site being the cavity of the body of the uterus, it may be impossible; save by the microscope, to differentiate the two diseases. Clinically there are these distinctions—

The slower course.

The connection with sterility—twenty-five out of sixty-three cases (Gusserow).

The discharge is not so offensive and is more watery, containing greyish-white shreds of sarcomatous tissue.

Pain is not so invariable a symptom. Thomas accounts for the absence of pain in some cases, to which special attention has been drawn by A. R. Simpson, by the portion of the uterus in which the sarcoma occurs. *If the sarcomatous growth be parenchymatous the pain is severe; not so, if it be diffused in the endometrium.*

Sarcoma agrees with carcinoma clinically in—

The tendency to recurrence ;
The hæmorrhage which attends it ;
The foul discharge after ulceration of the surface ;
The pain ;
The soft and friable nature of the growth in many instances ;
Its fatal termination (in septicæmia, hæmorrhage, peritonitis).

For diagnostic purposes, sarcoma can only be clearly distinguished from carcinoma, fibroid growth, or chronic hyperplasia, by means of the microscope and the detection of the characteristic spindle or round cell.

Prognosis.—This, in every form of malignant disease, is most unfavourable. The average duration of life in cases of cancer of the cervix is from twelve or eighteen months to three years. Such a termination as *spontaneous recovery* has been recorded. But this is so rare that its possibility is hardly to be taken into consideration. On the other hand, if the disease be detected very early, and a partial cure be attempted by removal of the diseased tissue and the free use of the cautery, we may prolong life, if we do not succeed in curing the disease. Death ultimately takes place from exhaustion, septicæmia, or peritonitis, and occasionally from hæmorrhage. The only step to be relied on for giving the woman a chance of life for any considerable time is hysterectomy.

CHAPTER XXXII.

CANCER OF THE UTERUS (continued).

Treatment.

WE may, for clinical purposes, divide the treatment of malignant disease of the uterus under the heads of *palliative* and *radical*.

Palliative and General Treatment.

The actual cautery.

Chloride of zinc.

Chromic acid.

Potassa fusa.

Nitric acid.

Carbolic acid.

Chlorate of potash.

Chian turpentine, internally
(Clay).

Sedatives internally :

Opium.

Morphia, subcutaneously.

Nepenthe.

Chloral hydrate ; chloralamid.

Bromides.

Cannabin.

Hyoscyamus.

Sedatives locally :

Belladonna and morphia sup-
positories.

Cocaine.

Anodyne washes.

Antiseptic and disinfectant vaginal washes :

Condy's disinfectant.

Formalin solution, 72 per cent.

Peroxide of hydrogen solution.
1 per cent.

Chloral hydrate.

Carbolic acid.

Boric acid.

Thymol.

Chloride of zinc.

Sulpho-carbolate of zinc.

Tincture of iodine.

Chinosol.

Astringents :

Perchloride of iron.

Sulphate of iron.

Tannic acid.

Alum.

Acetate of lead.

Other treatment :

High-frequency current.

The X rays.

Radium.

Inoculation.

Attention to the Rectum.—The state of the rectum is of great importance. The occasional use of enemata or saline waters, and aperient confections and soft food, will do much to prevent the accumulation of scybala and consequent pressure on the diseased part.

Caustics.—Of various caustics, other than zinc chloride, fuming nitric acid is one of the best. Its mode of application has been previously noticed, as has also that of potassa fusa. Chromic acid (ʒi—ʒi.) for relieving pain, arresting hæmorrhage, and checking the ulcerative process, I have always found of great service.

Deodorants.—The use of escharotics must be combined with anti-septic and disinfectant applications, in order to keep the vagina free of the tissue débris, and prevent the horrible odour which is frequently present. For this latter symptom Sirédy recommends the vagina to be washed out with a solution of perchloride of mercury (1 in 3000), after which a plug of absorbent cotton-wool soaked in a choral solution (4 per cent.), and dusted with iodoform, is applied to the cervix. This is renewed after two days, and reapplied as often as it is deemed necessary. Condyl's fluid, thymol, chinosol (1 in 600), formalin (1 in 1000), and peroxide of hydrogen, are admirable deodorants and disinfectants.

Sedatives.—Pain may be relieved both by local suppositories and pessaries, and the internal administration of *sedatives*. Cocaine, in my hands, both locally applied and used subcutaneously, has failed to give relief. Morphia, injected subcutaneously, is the best means I know of for subduing the pain of uterine cancer. Its use should be postponed for as long a period as possible. It is in the last stage of the affection that it is so necessary. If it be administered earlier it may lose its effect, and fail to give the looked-for relief when it is most needed. It is a good plan to alternate its administration with some other sedative, or a different preparation of opium, given either by mouth or rectum. Chloral and the bromides, or cannabis indica, lupuline, hyoscyamus, monobromate of camphor, conium, heroin with codeine, are also useful. It is better to give the full dose at a stated hour in the day, generally approaching night, when the parts have been dressed and the patient has had any local treatment applied.

Internal Remedies.—The more carefully we consider all the vaunted '*cures*' of cancer, which from time to time have been practised, the more we must realize that, up to the present, the only treatment which can be accepted as having any claim to be looked

on in the light of a 'cure' is the operative. Whatever the future may have in store for surgery in the direction of the X-ray, radium, the high-frequency currents, or inoculation, as yet there is nothing definite to rely on.

Chian Turpentine.—Clay, of Birmingham, placed before the profession some apparently startling cures by means of the Chian turpentine. Having anxiously tried this medicine with several cases, both in the form of pills and in emulsion, I may record my experience of its effects. In several instances it certainly appeared to arrest the disease, to lessen the pain, and to check hæmorrhage. In none was the effect permanent. In other cases it decidedly restrained the hæmorrhage, but did not arrest the progress of the disease. In some it had apparently no effect whatever.

The combination of arsenic and quinine in the cachexia of malignant disease of the womb is useful.

Hæmorrhage may be controlled by styptic tampons. These must not be left longer in the vagina than twelve hours. The use of warm-water injections to 120° should be tried, with the liquid extract of hydrastis and tincture of matico added. Internally, astringents may be given in combination with ergot, also Chian turpentine, hydrastinine, or stypticine. The *strength* of the patient must be maintained by a nourishing but not over-generous diet. Some stimulants are generally necessary; the kind and quantity will depend on the circumstances of the case. Change of air, a well-ventilated sleeping apartment, cheerful companionship—in short, everything that can contribute to make the life of the patient as fairly comfortable as the terrible nature of the malady will admit—should be advised.

Treatment by the X Rays.—With regard to the treatment of carcinoma by the X rays, various contrivances have been devised to concentrate the rays on growths, both in the rectum and vagina. Pennington of Chicago devised a shield of metal, which clasps the X-ray tube round, and has a cylindrical prolongation which can be used as a speculum, or to which the speculum can be attached.* Cases have been recorded in which not only does the growth appear to have been arrested, but cicatrization to have taken place from the effects of the rays.

Cleaves, Grubbe, Scully, and Dawson Turner have reported favourably on the action of the X and ultra-violet rays in inoperable cancer of the cervix.†

* *Ann. Gyn. and Ped.*, May, 1903.

† *Amer. Gyn.*, Nov. 1902; *Med. Rec.*, Nov., 1902; *Amer. Med.*, Feb., 1903.

The Reports of the Cancer Hospital (London) do not warrant any definite conclusions being drawn from the X-rays in inoperable cases. There, again, in some cases arrest of the growth and lessening of the pain have followed the treatment. The conclusion is that the X-rays may be tried in cases in which operative treatment has effected all that can be expected of it.

Radium Treatment.—The results of the *radium* treatment at the Cancer Hospital are also most disappointing, and the reports of Plumer on the effects are practically “nil.” The same may be said of the inoculation treatment.

Animal Extracts in Treatment of Carcinoma.—Bell, of Glasgow, has reported cases of carcinoma in which amelioration of the symptoms has followed the administration of thyroid extract. This was, however, combined with active local treatment, the application of iodized phenol, and ichthyol tampons, and, in some cases, with curettage and caustics.

In cancer of the body of the uterus there is nothing to add to what has been said of the *palliative* treatment of malignant disease of the cervix.

Costive Bowel.—The clinical fact that obstinate costiveness and distension of the rectum occurs in cases of *scirrhus*, should not be forgotten. In a case of cancer of the body of the uterus in a lady aged fifty-five years, the fatal termination was precipitated by the accumulation of hard fæces in the rectum. Every means failed to extract these, and I had to dilate the rectum and remove some masses with the hand. One was of stony hardness; with difficulty could I saw it through with a knife.

Inoperable Cancer.

In cases of inoperable cancer, the actual cautery is our most powerful means of arresting the spread of the disease and checking hæmorrhage. In some foreign clinics, as in that of Bumm, the old bullet-shaped iron cauteries are preferred to Paquelin's, several of these, heated by gas, being kept ready to hand. The patient is placed in the lithotomy position under anæsthesia. The vaginal walls are held widely apart by broad retractors, the uterus is exposed, and drawn as far as possible towards the outlet. With the spoon curette as much necrotic tissue as possible is removed, and the cavity thus left is dried by packing with gauze, soaked if necessary in some styptic solution, such as alum, perchloride of iron, or peroxide of hydrogen. The Paquelin knife or the button end is then applied. Should the uterine wall be thin, caution must

be exercised in order to avoid injury to either the bladder or rectum. When the cauterization is finished, the cavity is packed with gauze soaked in strong perchloride of iron solution, or, what I prefer, that of chloride of zinc (one drachm to the ounce).

Lomer has recently written* on the use of the cautery in cancer of the uterus, and the beneficial effects which follow its application, noting the variable results in point of time before recurrence of the disease in 213 cases. The effect of the cautery in causing the death of the cancer cells, and the influence of heat on their vitality, he thinks account for this. He also believes that the extreme exhaustion which follows from profuse hæmorrhage from cancer, and the drain on the system, tend to arrest the progress of the growth. He tried hæmolitic serum, suggesting that an epithelial serum may also be found which will have a preventive influence on carcinomatous growth, even a specific form of serum for each variety of the disease. He inclines to the administration of chloride of potash and arsenic, the former also being used for vaginal irrigations. He advises the repeated application of the cautery in inoperable cases.

Operative Treatment of Cancer of the Cervix.

Once carcinoma of the cervix is discovered, the uterus should be removed. In view of our present knowledge, to adopt any other course is to subject the woman to the gravest risk of the spread of the disease, and to deprive her of the chance of cure, or at least prolongation of life.

If the patient decline to submit to the radical operation, at least the minor step should at once be taken of high amputation of the diseased cervix. And this does not interfere with resort to the more radical measures subsequently, if there be recurrence of the disease.

Freund insists that the diagnosis of cancer is an immediate indication for the total extirpation of the uterus, and that the operation thus early performed at the commencement of the disease offers the best prospect of a permanent cure. The abdominal operation he thinks better than the vaginal one, which latter should be reserved rather as a palliative step for cases in which the radical operation is unsuitable.

* *Zeitch. f. Geb. und Gyn.*, 1904.

Influence of the Lymphatic Distribution on the Operative Treatment of Cancer.

Various authorities differ considerably as to the percentage of glandular involvement in uterine cancer, but, as Gellhorn points out, they are derived from post-mortem records of women who 'had died from a far-advanced stage of cancer,' and many had not been verified by the microscope, which method of examination is not itself without possibilities of error. In 68 cases, collected by Gellhorn, of abdominal radical operation, the glands were affected in from 34 to 35 per cent.; and in 86 other cases the percentage of the entire number was about the same—in a total of 128 cases the amount being 33·6 per cent.

It would appear, from the researches of various authorities, that in the early stages of the primary growth in the cervix the glands are more frequently involved; and the view of Cullen, with regard to the frequency of glandular involvement in carcinoma of the portio, appears to be generally true, namely, 'that the growth must extend far out into the broad ligament before infection of the lymphatic glands can take place. Jordan shows that among twenty-seven cases of cancer of the colon there were seventeen with intact glands, though ten out of the seventeen presented the disease in an advanced stage. His conclusion generally is, that glandular involvement from cancer of the uterus is comparatively rare, and when it does occur it is in the latter stages of the disease. Kelly comes to the conclusion that extension of cervical cancer *per continuitatem* is the rule, extension by glandular metastases *per saltum* unusual, in the early stages of the disease.

With regard to glandular involvement in cancer of the body, authorities are generally in accord with the views of Cullen, that the inguinal glands are rarely invaded by the carcinoma. On the whole, the conclusions of Gellhorn, from the pathological reports of a variety of operators, both as to the involvement of the glands by carcinomatous invasion, and also secondary metastases, tend to prove that we have not sufficient data to support, at least up to the present, the proposal of some operators to perform the more extensive operation with removal of all the glands and the parametrium, save in exceptional cases of carcinoma. He asks, How is the operator to know whether and where he will discover suspicious glands? Is he able, before or during the operation, to detect the presence of enlarged glands? Authorities are somewhat divided as to the possibility, even under anæsthesia, and by any method of examination, of palpating the pelvic and lumbar glands. Even the

exponents of the more radical methods, such as Wertheim and Funke, and such careful investigators as Cullen, Winter, Irish, and Krönig, declare the impossibility of glands, even up to the size of a pigeon's egg, being determined by touch before operation. On the other hand, the lymphatics of the broad ligaments have been invaded and found indurated, and the lymph channels and lymph vessels impregnated with carcinoma, the carcinomatous elements not being filtered by or deposited in the glands. According to Cullen, the carcinomatous growth spreads far out into the broad ligament before involvement of the lymphatic gland occurs, a view corroborated by several authorities.

Conclusions.—We thus come to the three views as to the extent of the radical procedure which should be carried out. First, there are those in America and the Continent who advocate the extreme radical step in which, as a routine procedure, all glands are removed as a preliminary measure in the technique of hysterectomy, and such operators ablate the whole lymphatic and glandular system of the pelvic cavity with the parametric tissue, even including the rectum when necessary—Amann, by the transperitoneal method, removing the greater part of the vagina with all the pelvic glands and their lymph vessels, the infiltrated and the non-infiltrated, and the connective tissue structures of the lateral and anterior regions of the pelvis.

Next we find a class of operators who follow Wertheim's method, who does not proceed beyond the bifurcation of the aorta in any case while extirpating the gland, and only removes the latter in a certain percentage of cases. Such operators as Doederlin and Zweifel remove only such glands as are palpable or suspicious; as also Funke, Menge, and Krönig, these latter placing as much importance on the ablation of the parametria as of the glands. Lastly, we find a number of operators of such standing as Jacobs, Olshausen, *v.* Ott, and Hofmeier denying the possibility of the removal of the glands in their entirety or the lymph channels, search we ever so carefully during operation; and Gellhorn, in his exhaustive review, in noticing the attachment of the carcinomatous glands to the large bloodvessels, says that it occurs to him that under such conditions any operation would be utterly useless, and he asks the two crucial questions—Is the systematic removal of glands really necessary? Has it improved the final results of the less radical method? In answer to these queries, he shows that, from the recurrences after the extreme radical methods in the best hands,

such as those of Winter, Schauta, Wertheim, Ferrier, and Kelly, it is questionable if the removal of the glands is necessary, or has added to the value of the radical operation. Reviewing the entire subject, it would appear, so far as our present knowledge of these extreme radical methods and removal of the glands are concerned, that the results are hardly more hopeful than those obtained by a free pan-hysterectomy, with removal of such glands as may be felt, the involved parametria, and the ablation of as much of the vagina as may be called for.

Of 140 cases of abdominal radical operation for cancer, reported on by Oehlecker, the glands were affected in 35 per cent.; and in 30 per cent. they were enlarged by hyperplasia and infiltration, without cancerous deposit. In seven of Olshausen's patients who died after the vaginal operation, the glands were enlarged in all cases, and in some 30 per cent. metastases was present.*

Minor Operations.

Amputation of the diseased cervix is performed either with the galvanic or wire *écraseur*, Paquelin's knife, a scissors, or scalpel. The latter is certainly preferable. In all these operations the dangers to avoid are: (a) Hæmorrhage, (b) Injury to the bladder or rectum. The most important points to attend to are: Complete removal of the diseased tissue by cutting through to the healthy structure outside it, and the destruction of any infiltrated tissue after removal of the disease by the free use of caustic or cautery.

Schroöder performed two minor operations, one an *infra-vaginal*, the other a *supra-vaginal*, amputation, of the entire cervix. In both these operations the knife is used, and the wounds are closed by sutures. In the *infra-vaginal* operation, having first created anterior and posterior lips, a wedge-shaped portion is removed from both. In the *supra-vaginal*, the incisions are made through the vaginal mucous membrane in either fornix. The bladder and Douglas' pouch are carefully avoided. The cervix is cleared of its cellular tissue, and the amputation is completed by the final stitching of the anterior and posterior vaginal walls, which are united to those of the uterus. Ligature of the uterine arteries considerably facilitates the steps of the operation.

The Galvanic Écraseur.—The patient is anæsthetized, and, when the uterus is thoroughly exposed, the cautery loop is slipped on cold and pushed as far as possible on to the healthy tissue; the current is applied, and the wire is tightened slowly; slight traction is made while it cuts through, so as to secure a funnel-shaped stump (Byrne of Brooklyn). The mucous membrane is divided circularly with an ordinary knife, and detached for a short distance. The

* *Zeitsch. f. Geb. u. Gyn.*, bd. 48, heft 2.

section is then completed with the curved Paquelin knife, by the use of which there is very little bleeding.

In using the chain or wire *écraseur*, the uterus has to be drawn well down and fixed by a *vulsellum*. The uterine arteries may be first secured, the uterus bisected, and either half removed. The screw must be worked slowly. The stump should be treated with the actual, Paquelin's, or the electric (porcelain) cautery (p. 144).

Thermo-Cautery.—The thermo-cautery is applied to the ulcerated cervix after free scraping of the ulcerations. If the interior of the uterus be affected the cervix is fully dilated, a saturated solution of chloride of zinc is applied, and, after cauterization, the cavity is packed with iodoform gauze or cotton-wool (Vuillet).

The curette must be applied freely, according to the extent of the disease. If the cancerous infiltration should have encroached on the wall of the bladder in front, or the peritoneum posteriorly, care must be taken to avoid opening into the peritoneum, bladder, or rectum. After the use of the curette, Paquelin's cautery, the tampon of chloride of zinc, or the alcoholic solution of bromine (Routh and Schröder), 1 part to 5, chromic acid, or peroxide of hydrogen, may be applied. The free use of the cautery is to be preferred. If bromine be selected, some cotton-wool saturated with the solution is pressed against the surface of the wound, and the vagina is subsequently well plugged with a tampon either soaked in a solution of, or covered with, carbonate of soda. The bromine tampon may be left in for twenty-four hours. The application may be renewed in about ten days if necessary.

'I have seen,' says Spencer Wells, 'several cases treated by the late Wynn Williams with bromine, but not one ended satisfactorily, although temporary good was done.'

Chloride of Zinc.—The steps of the method advocated by Marion Sims are as follows: (1) The bed of the diseased mass in the supra-vaginal cervix is removed with the knife, scissors, or spoon. (2) The cavity is dried, cleaned, and prepared for the styptic application. (3) The dried cavity is plugged with cotton-wool, which is squeezed, nearly dry, out of sub-sulphate of iron solution, or weak solution of carbolic acid saturated with powdered alum. The upper part of the vagina is packed with the same, and the lower portion with simple carbolic solution. In five days the plug is removed. Some pledgets of cotton-wool are squeezed dry out of a solution of five drachms of chloride of zinc to the ounce, and packed into the uterine cavity. The upper part of the vagina is plugged with cotton-wool soaked in carbonate of soda solution. All is removed after four days.

I have on some occasions used chloride of zinc with excellent results, leaving only a shell of the uterus.

Jessett showed, at the Gynæcological Society, the cast of an entire uterus removed by packing with chloride of zinc paste. He places a gutta-percha covering over the whole, and neutralizes the caustic with carbonate of soda.

Browne and Mundé have recorded cases in which, after the uterus was curetted and tamponed by the former surgeon with zinc chloride, and by the latter with perchloride of iron, the entire organ came away on the tenth day in both instances.

Meinert* also strongly advocated the treatment by chloride of zinc. He uses the mixture of equal parts of chloride of zinc and starch to form a paste.

Choice of Operation.—On the much-debated question as to which form of operation is to be advised, and the nature of the technique to be followed in carcinoma of the uterus, views of prominent gynaecologists materially differ. Our course, however, will be in great measure determined by the situation of the disease, its extent, and the degree to which the lymphatics of the pelvis and the parametrium are involved.

Hysterectomy by the vaginal route has come to be regarded as *the* treatment for cancer of the cervix and portio, once the presence of malignant disease has been established. In the same manner, in cancer or any form of malignant disease of the body, when it has not extended beyond the uterus, and the parametrium is free, vaginal hysterectomy is indicated. On comparing the results of partial operative procedures with the more radical measure, it is apparent that there is little to gain by advising the former course when we offer so much greater security for the sufferer by the complete removal of the diseased organ.† If the disease be detected *very early*, and, while it is yet limited to the cervix, a Schröder's high amputation be performed, the results are by some still considered sufficiently good to warrant the choice of this measure instead of that of hysterectomy, and as compared with the radical operation, the gain in life appears to be not much less. On the other hand, it cannot be denied that early and complete ablation of the diseased organ, before the lymphatics of the pelvic glands have become seriously involved, offers the patient the greatest certainty of the removal of the entire disease. Recurrence varies, in the majority of such favourable cases, from a period of two to six years. Some 50 per cent. of all cases recur within a period of time varying from eighteen months to three years. Five years must be taken as the lowest limit to speak of 'non-recurrence' of the disease.

After total hysterectomy, a relatively small number survive this period, and live for a longer time without recurrence, while a comparative few escape altogether from the reinvasion of the cancer. As Japp Sinclair says, 'though called major, the radical operation is, perhaps, less dangerous than many of the so-called minor operations.'

Gradually, therefore, the minor operative procedures have given

* *Muench. Med. Wchns.*, 1902, No. 39.

† The statistics of Schröder, Verneuil, Winter, and Leopold proved this.

place to the two methods of hysterectomy: firstly, that by the vaginal route; and secondly, that by the abdominal. The question whether an operation is warrantable or not, depends altogether upon the degree of extension of the disease. Given a movable uterus and one capable of being drawn down to the vulva, and where the broad ligaments and the pelvic glands are not implicated, there need be no hesitation, and here the operation of selection is that by the vagina. Even in cases in which the portio vaginalis is involved, and there is vaginal infiltration, the feasibility of removing the entire vagina proves that in such cases the involvement of the vaginal fornix need not deter us from operation. On the other hand, if the disease should have extended beyond the uterus, and the broad ligaments or the glands be implicated, or if the disease be complicated with a myoma, the facility for reaching these extra-uterine structures offered by the abdominal route makes it, either alone or combined with the vaginal, the most favourable operation for such cases.

Vaginal Hysterectomy for Cancer.*—We have already, in the case of myomata, described the various methods of performing vaginal hysterectomy in the case of tumours of the uterus. The operation necessarily varies somewhat in the instance of cancer of the neck or body of the uterus. The probability of recurrence, the extent of the cancerous infiltration, and the involvement of glands, necessitate the wide removal of the disease. Therefore, in all cases, the uterus is first thoroughly curetted,† and a section of the neck having been made, the lips are stitched together, and for purposes of traction are held by strong suture threads. Other surgeons, however, prefer the use of the tenacula, or after curettage use Orthmann's instrument (Fig. 187) to grasp the uterus. Others, again, amputate the diseased cervix with the Paquelin's knife before proceeding to remove the uterus. Also, in operation for cancer, the friability of the invaded tissues has to be remembered, and it is specially necessary, by most careful examination and exploration beforehand, to estimate the degree of involvement of the rectum, bladder, and parametrium. Kelly adopts Pawlik's recommendation to pass a ureteral bougie in those cases in which we fear inclusion of the

* The different methods of performing vaginal hysterectomy have been already described in treating of myoma and pelvic suppurations.

† Some authorities demur to the preliminary curettage in certain cases as too exhausting to the patient, and adding to the risk through the undue prolonging of the operation (Cullen—Wertheim).

ureters, as a guide to their avoidance during the operation. Under any circumstances the detachment of the bladder and the avoidance of the ureters is the most important and delicate part in the operation for cancer. Gentleness in working with the finger towards the uterus, and the use of a small sponge in separating the bladder, will go far to prevent the first accident; keeping the scissors close to the uterine neck, and cutting towards the uterine tissue, the second.

Where necessary, an incision of the vaginal mucous membrane with the scissors, a few centimetres outside the limits of the growth,

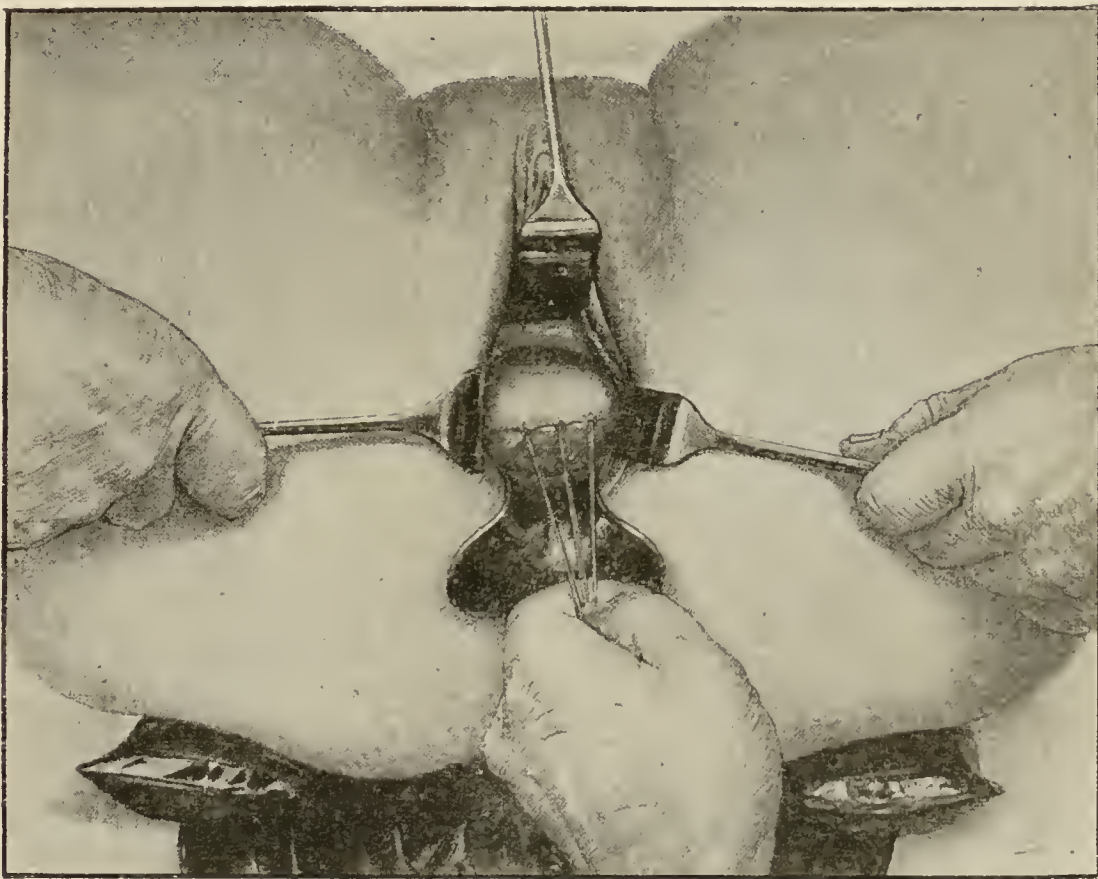


FIG. 416.—CERVIX HELD BY SHORT SILK SUTURES WHICH HAVE BEEN PASSED FOR TRACTION AFTER CURETTAGE OF THE ENTIRE UTERINE CAVITY. (HOWARD KELLY.)

is made at either side, and these marginal incisions are connected with that over the anterior surface of the uterine neck. The mucous membrane is then detached by the left index-finger from side to side, and this is followed by careful separation of the bladder in the manner already described. Should the bladder be unavoidably injured, it is immediately sutured. Having completed the opening of the anterior cul-de-sac and the attachment of the bladder, the posterior cul-de-sac is incised with scissors, and the uterus and broad ligaments are explored through the opening. Any detachment from the cellular connections are here effected by the

scissors. The uterus is now removed by ligation of the vessels from below upwards, first at one side, then at the other, with section of the broad ligaments. Finally, the adnexa are drawn down and the ligatures are applied outside these, as in the case of pan-hysterectomy for myoma. The ligation and section are made as far as possible from the uterus, and any invaded glands which are found are at the time removed. If the cancer be in the body of the uterus, or have invaded it, and there is consequent enlargement, after the disinfection of the canal it may be necessary to reduce the bulk of the uterus by hemisection, and remove either half separately, or it may

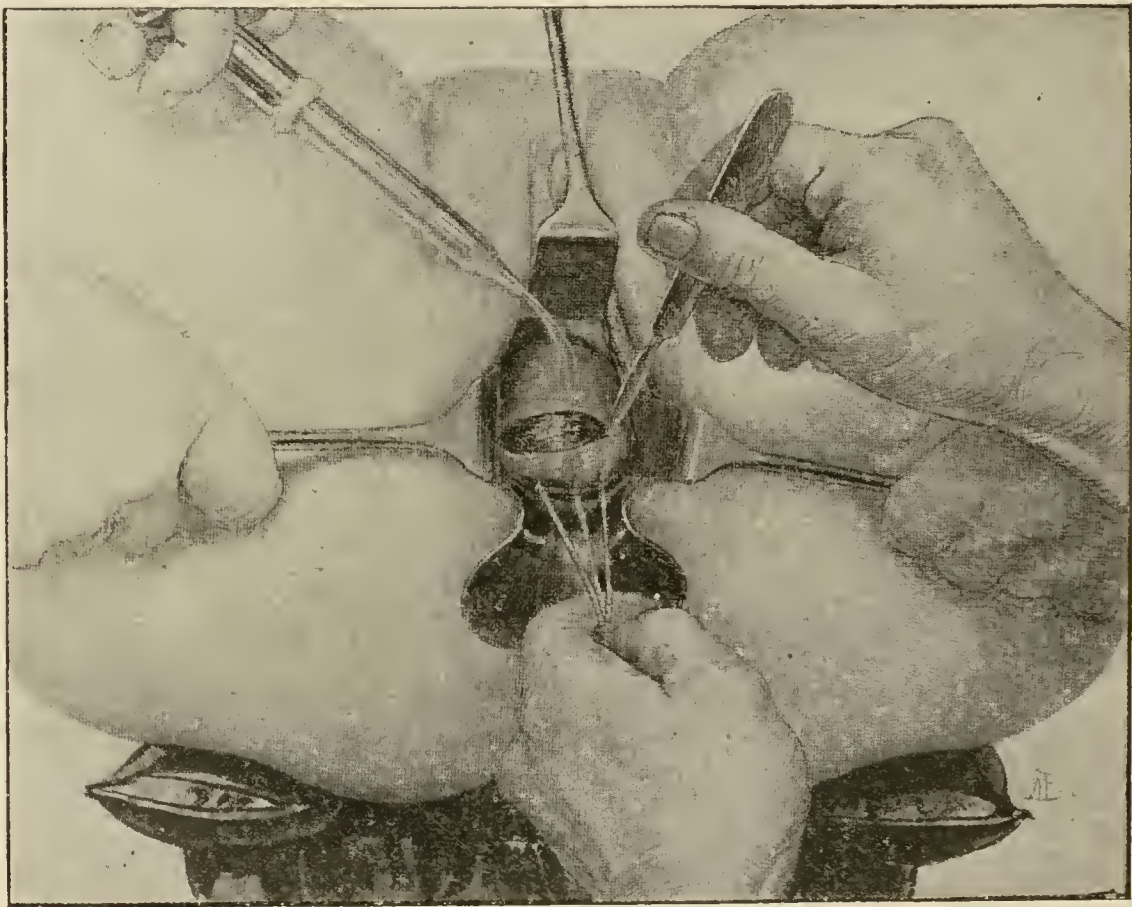


FIG. 417.—ANTERIOR INCISION ACROSS THE CERVIX TO FREE IT FROM THE VAGINAL VAULT UNDER IRRIGATION. (HOWARD KELLY.)

be reduced by a V-incision of the anterior wall. It is always necessary to prevent escape of the infiltrating neoplasm into the pelvic cavity and the peritoneum, so as to avoid the dangers of infection.

In cases of difficulty, having first catheterized the ureters, Kelly bisects the uterus from above downwards, and then, allowing retraction of one half within the vagina, the cervix is seized, and the body of the uterus is severed from it by dividing from within outwards. Next, the uterine vessels are clamped, the detached body is drawn further out, and the round ligament is clamped, as well as the uterine cornu. One quadrant of the uterus is thus removed, and the opposite side is dealt with in a similar manner. Ligatures having

been applied, the clamps are taken off and the adnexa then removed. The ablation of the cervix follows. That half which is least implicated is first removed. Space is thus afforded for the exsection of the remaining half of the cervix, and this is done either by ligature or the electro-thermic cautery. Kelly does not hesitate in certain cases, if the ureter cannot be left intact, or



FIG. 418.—FOUR PIECES OF A CANCEROUS UTERUS EXTIRPATED BY QUADRISECTION. (HOWARD KELLY.)

On the right side a large section of the ureter has been removed with the cervix.

dissected out, to cut it across, and after the enucleation is over to transplant it into the denuded bladder and fix it there. Finally, he draws down the anterior and posterior peritoneal surfaces, attaching them to the vagina, and sutures them in the middle line, so as to leave but two small openings into the pelvis, which are stuffed with gauze.*

In removing a very enlarged uterus, or in cases of small vaginal outlets, it may be necessary to incise laterally the posterior commissure as far back as either side of the rectum, which will give the necessary room. I use the vaginal tap or douche retractor already described for irrigation (Fig. 105). This latter washes away any clots, and quickly clears the bleeding surfaces.

Duties of Assistants—Retractors, Ligatures, Irrigation.

There is no more important duty of assistants in the operation of vaginal hysterectomy than that of the proper use of the right **retractors** during the steps of the operation. Awkward assistants prevent the proper exposure of the parts and the due protection of both bladder and rectum. The lateral retractors should be held well into the vagina at either side, holding back its walls so as to leave sufficient room for the exposure of the parts to be ligatured, the admission of the finger for exploration, and the carrying of the needles over the broad ligaments. These retractors have been figured in describing the operation for myoma.† Again, the triangular retractor of Martin should be slipped well in underneath the bladder and held securely up

* See chapter on the Ureters.

† See pp. 518, 519, and 521.

against the pubes, unless the operator desires its removal for purposes of exploration. The large posterior retractor is likewise held steadily, depressing well the rectum and perineum.

Another point of importance to impress on assistants is the tension they use in holding **ligatures**. If these be too much drawn on, they are apt to slip and give rise to most troublesome hæmorrhage. Therefore, as soon as the part to be ligated is severed, all traction on the ligature should cease. If there be difficulty in securing a bleeding vessel, and any uncertainty remains

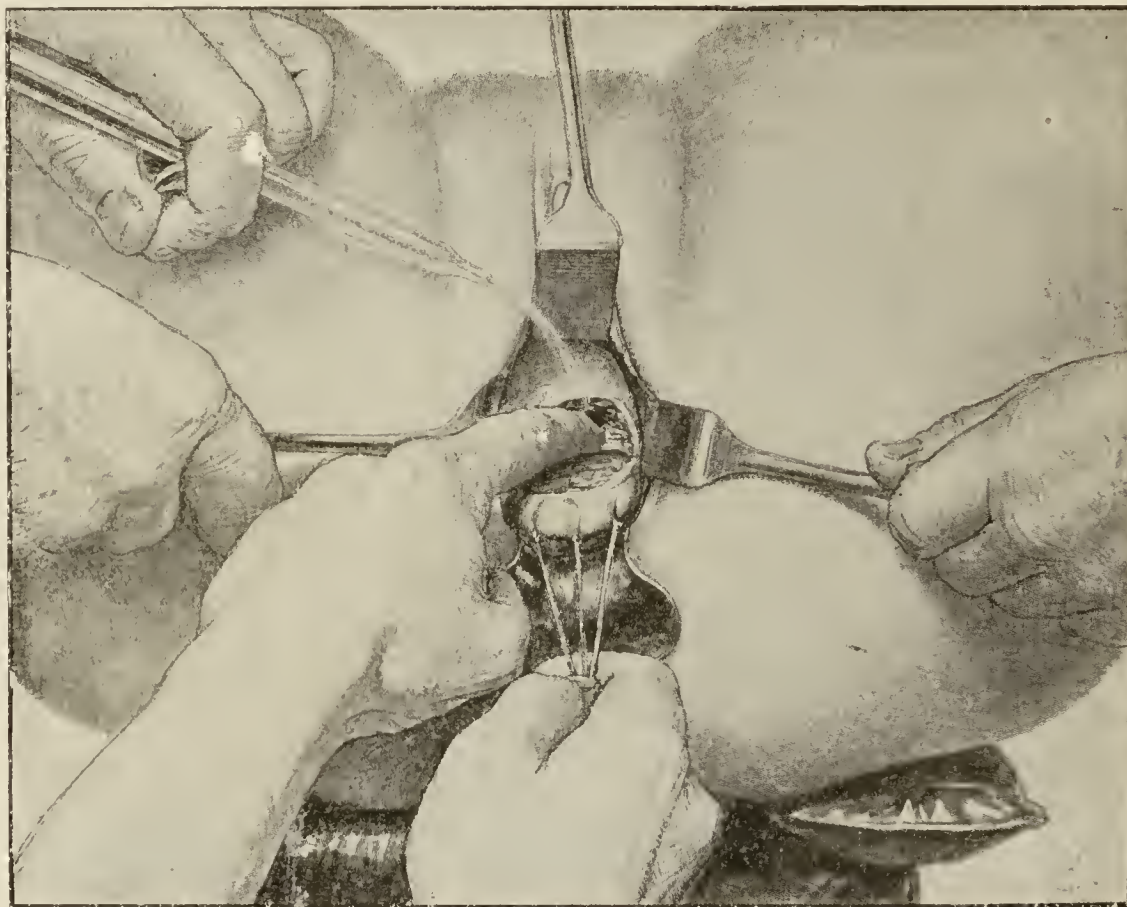


FIG. 419.—SEPARATION OF THE BLADDER FROM THE CERVIX, AND THE APPLICATION OF RETRACTORS. (HOWARD KELLY.)

as to its safety, it is far better to treat it by forcipressure, and leave the forceps on, than to take any chance of subsequent hæmorrhage.

Irrigation.—The assistant who irrigates should, at the commencement of the operation, regulate the stream, which should not be too strong, but sufficient to play lightly on the part, so as to wash away the blood and keep the surface clean. The flushing retractor or pipette should be held steadily, and turned in the direction required without the necessity of a word from the operator. There is an art also in the use of *dabs* or *sponges*. The nurse or assistant should have a few light and long clamp forceps, and these should be alternately used with the different-sized pieces of gauze, or small ready-made dabs, according as they are required. The handing of the proper-sized dab or compress, the light wiping of the part so as not to disturb ligatures, and the exercise of the proper pressure on a bleeding surface or vessel, are all points to be carefully attended to, and are only to be acquired by practice.

Schauta adopts the plan of A. Martin, of suturing the peritoneum to the anterior vaginal wall, and does the same posteriorly. He also divides the

uterus into two parts, in cases in which there is difficulty in removal from infiltration or adhesions. His needle-holder,* which has been already figured is most convenient for the vaginal operation, the curve in the handle allowing it to be passed deeply at either side. He uses Ehrenfest's ligature tightener when he has to secure the ligature at a considerable depth or high up in the pelvis. He does not cut his ligatures short, but leaves them for subsequent removal.

Doyen's Vaginal Hysterectomy in Cancer.—As regards vaginal hysterectomy, Doyen has divided his procedure into the following stages:—

'First stage: incision of the posterior fornix, opening of Douglas' pouch, and exploration of the pelvic cavity. Second stage: incision of the anterior fornix and separation of the bladder. Third stage: crushing of the lower and middle parts of the broad ligaments. For this purpose the angiotribe is applied on each side for from fifteen to twenty seconds. The uterus can then be easily drawn down. Fourth stage: anterior hemisection of the uterus, either

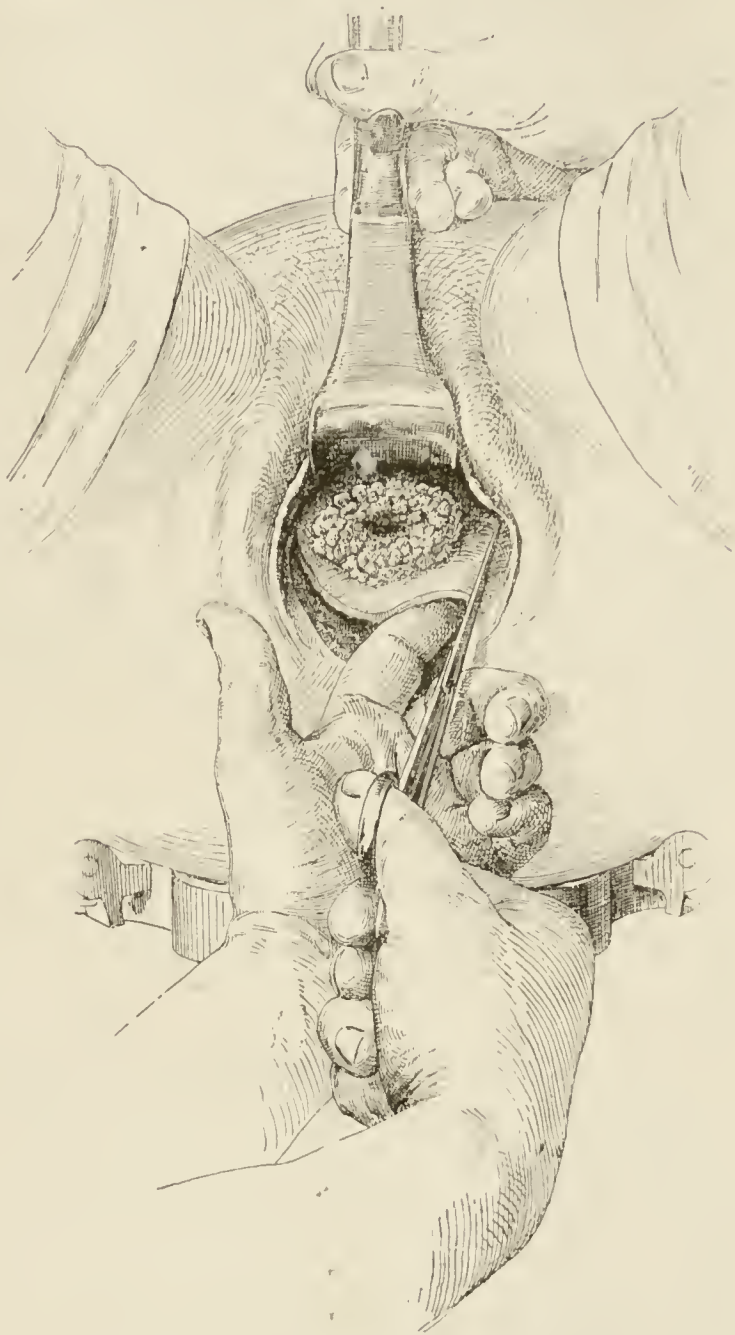


FIG. 420.—DETACHMENT BY SCISSORS OF THE VAGINAL COLIC RETTE. (DOYEN.)

by median or by V-shaped incision, and drawing down of the uterine fundus. For a small uterus the median incision suffices to allow the fundus and the adnexa to be brought down; for a larger tumour the V-shaped incision is employed. Fifth stage: application of a pressure forceps on each broad ligament and separation of the uterus. Sixth stage: crushing of the upper border of the broad ligament and application of ligatures. After the application of the angiotribe for from fifteen to twenty seconds above the pressure forceps, a silk thread is tied in the groove formed by it. As the threads are gradually tightened, the assistant cautiously removes the angiotribe. A single thread thus embraces each broad ligament. Seventh stage: peritoneal toilet, co-aptation of the peritoneal flaps, and tamponing of the vagina.'

Results of the Radical Operation.—Franz asserts that all past

* See p. 520.

statistics prove that 10 per cent. of women suffering from carcinoma *of the neck* of the uterus remain free from recurrence for five years after the operation, and that permanent cures of cancer *of the body* amount to 60 per cent. Thus, taking a hundred women affected with carcinoma of the cervix, assuming that sixty are inoperable and forty treated by vaginal total extirpation, thirty will suffer from recurrence within five years after operation, and ten will be permanently cured. This supposititious example accords closely with actual facts. Schuchardt, by his operation (see p. 600), secured five years' freedom from recurrence in 40 per cent. of his cases, though he did not remove the pelvic lymphatic glands. While the mortality from the vaginal operation may be said to be from 3 to 6 per cent., we may estimate that of the abdominal at the lowest as some 10 per cent. (It has already been shown from the operations of Wertheim, Doederlein, Rosthorn and Zweifel that the parametrium and the glands were involved in a large proportion of cases.)

A most complete radical operation is that of Bumm of Halle, which is thus described by Franz, of the same clinic:—

Bumm's Radical Combined Operation.*

The technique employed has been as follows: The cancer is exposed in a large vaginal speculum, and the portio vaginalis is seized with a hooked forceps and drawn outwards. The cancer is then scraped with a sharp spoon until no more tissue will come away, and a tolerably smooth-walled funnel is thus left, which is so thoroughly cauterized with a Paquelin that not a drop of blood or specific juice is visible on the surface of the growth. The infected area and the blades of the forceps are next thoroughly disinfected with alcohol and a one per thousand sublimate solution. The vagina is then plugged with a strip of gauze soaked in the sublimate solution.

The abdomen is opened (in the Trendelenburg position) in the median line, and any intestines which may come into view are pushed back out of the way and carefully protected. The fundus of the uterus is seized with volsella, and drawn upwards and to the right, so as to put the left ligamentum infundibulo-pelvicum with the spermatic vessels on stretch. Double ligatures are put round the ligament, and between them it is divided so that on that side

* Franz, *Brit. Gyn. Journ.*, Aug., 1903.

the two folds of the ligament gape apart. The finger, inserted in this gaping fissure, presses the folds of the ligament still further apart, and is thrust down to seek the ureter, which lies on the posterior fold of the ligament, and, if sought there, may always be found. When brought into view it is, for the time, left undisturbed. The round ligament is now ligatured and divided, and the peritoneum of the broad ligament separated as far as the attachment of the bladder to the anterior cervical wall. The whole of the connective tissue of that side of the pelvis is now open to inspection. Deep down one can trace the course of the uterine artery the whole way from its origin at the hypogastric artery to the uterus. It is ligatured at its origin and divided.

The ureter can then be laid free right up to its entry into the bladder without any bleeding, and when entirely detached from the cervix may be displaced, like a free cord, to one side towards the wall of the pelvis.

Exactly the same steps are taken on the other side, and, when both ureters have been exposed, the peritoneum of the anterior cervical wall is divided transversely above the bladder, and the latter separated by blunt dissection from the cervix and upper part of the vagina. The peritoneum of the posterior cervical wall is then also divided transversely above the pouch of Douglas, and the folds of Douglas are ligatured, and the peritoneum with the rectum is detached from the posterior cervical wall and upper part of the vagina.

The uterus and upper part of the vagina are now quite free before and behind, and their only attachments are through the tissue at the sides, below the spot where the ureters lie next to the cervix.

These attachments are secured as near the pelvic wall as possible, in Kocher's clamps, and are then divided. When this has been done on both sides, the uterus and upper part of the vagina are free all round, and can be amputated. The vagina is opened in front, and the incision carried right round it. It lies entirely at the discretion of the operator how much of the vagina is to be removed. The greater part, or even the whole of it, can be taken away without any difficulty.

The absolute arrest of all hæmorrhage is of extreme importance, and after the removal of the uterus every point that is still bleeding is secured.

The next step is to palpate the sides of the pelvis, especially along

the course of the great vessels, and to remove all glands that can be felt, with the connective tissue attached to them.

Finally, the wounded surfaces left by the operation are carefully shut off from the peritoneal cavity, inasmuch as the anterior fold of the broad ligament is united to the posterior, and the vesical peritoneum with that of the pouch of Douglas, by a continuous catgut

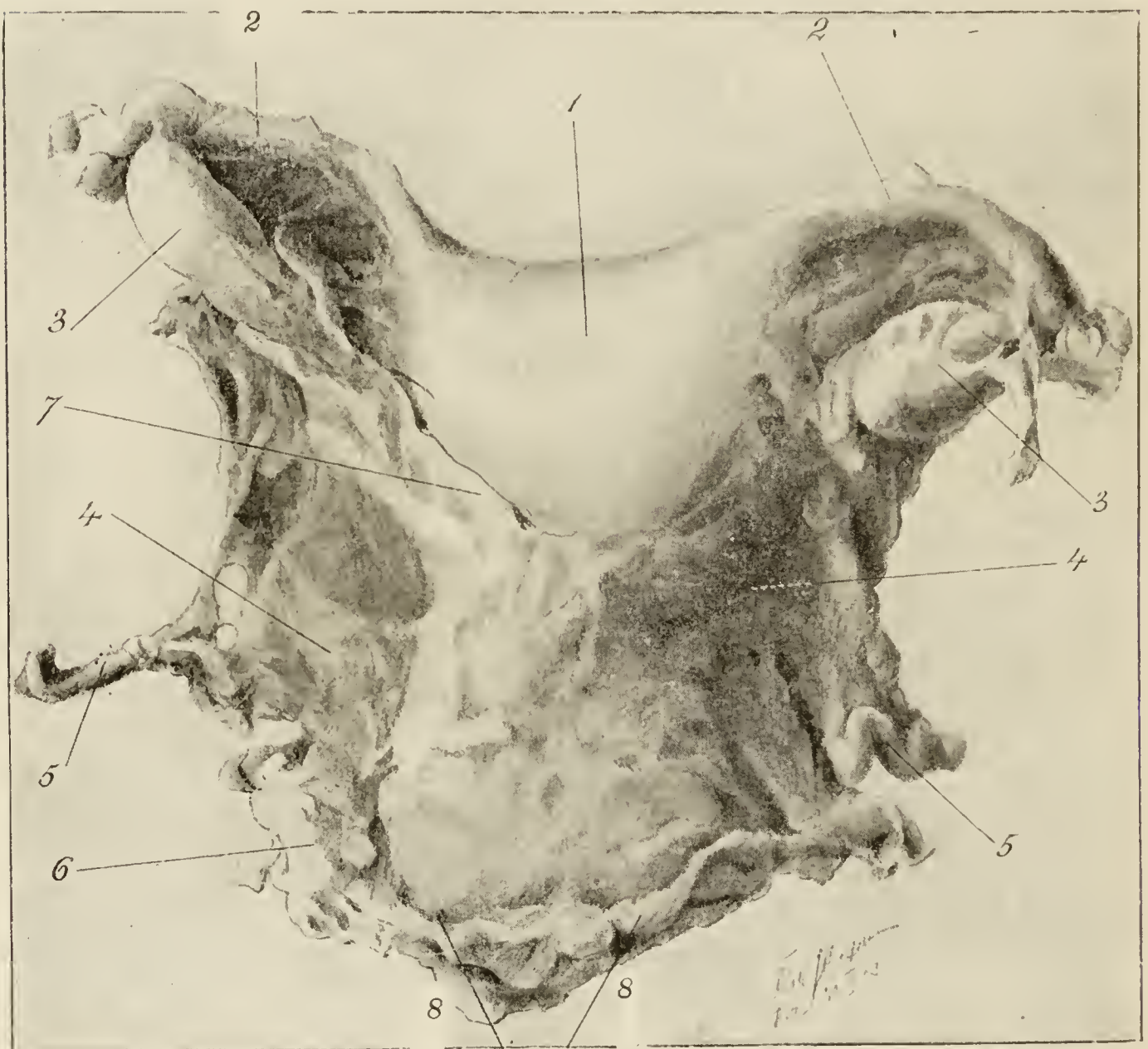


FIG. 421.—UTERUS REMOVED BY BUMM'S RADICAL ABDOMINAL OPERATION FOR CANCER (FROM BEHIND). (FRANZ.)

1, Fundus uteri; 2, 2, tubes; 3, 3, ovaries; 4, 4, parametria; 5, 5, arteriæ uterinæ; 6, parakolpium sinistrum; 7, left fold of Douglas; 8, posterior vaginal wall.

suture beginning at the left side. Above the catgut the serosa may be stitched with a silk Lembert suture for extra security. The abdominal wound is closed by continuous suture of the peritoneum and muscle with catgut, by interrupted silk suture of the fascia, and by one unbroken aluminium-bronze wire suture of the skin.

The last step is to insert by the vagina a short tampon in the pelvic wound. More complete tamponade has been given up, for the plug interferes with the healing of the wound by first intention, and may even lead to chronic suppuration, thrombosis, and pyæmia. The vagina is loosely plugged with iodoform gauze.

Jessett draws the peritoneal flaps firmly down, keeping the ends of the forceps approximated, and then packs strips of iodoform gauze tightly on each side of the flaps so as to cause the peritoneal surfaces to be brought into accurate apposition. By adopting this practice he says there is no necessity to unite the flaps by suturing. Should the drainage-tube be inserted, the flap is drawn well down in the same manner.

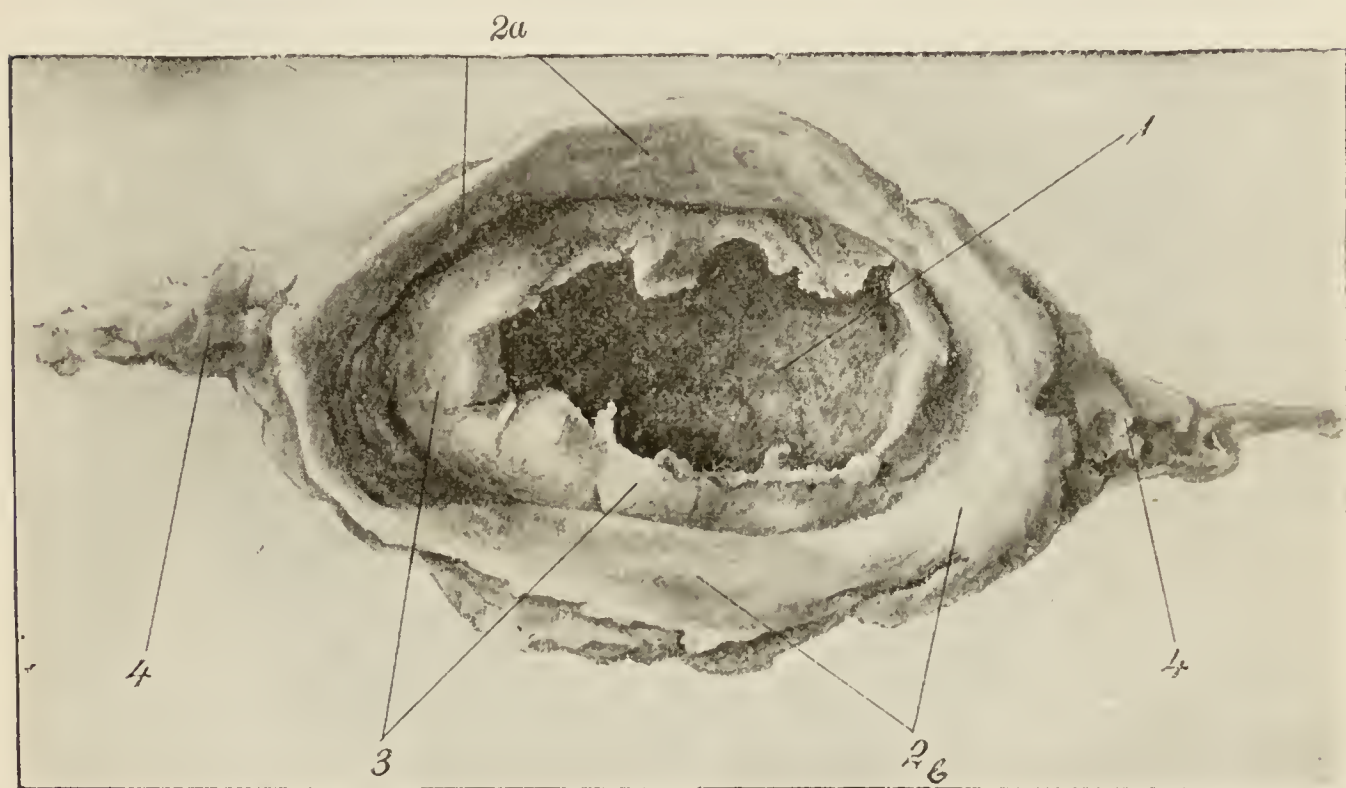


FIG. 422.—VIEW OF THE CARCINOMA FROM THE SAME UTERUS AS FIG. 421
(SEEN FROM BELOW).

1, Carcinomatous cavity; 2a, anterior; 2b, posterior vaginal wall; 3, portio vaginalis; 4, 4, parakolpium.

Werder's Operation (Pittsburg).—'The method entails two preliminary stages, in which all projecting cancerous masses are removed (several days before the operation), and the ureters catheterized: and two subsequent stages in which the uterus is removed. The first of the latter consists of the following steps:—Ventral coeliotomy, ligation of the round and utero-ovarian ligaments, opening of the broad ligaments, liberation of the bladder, dissection out and freeing of the ureters, ligation of the uterine arteries, freeing of the vagina before and behind, removal of the ganglia, suture of the anterior peritoneum—drawn backwards with the bladder—to the posterior peritoneum (whilst the uterus is drawn strongly downwards by means of a vaginal forceps placed on the cervix), and then closure of the abdomen. The second stage, performed at the same sitting as the first, consists in the division of the ring of vaginal tissue which surrounds the cervix by the thermo-cautery, the

extirpation *en bloc* of the uterus by the vagina, and the plugging of the vagina with iodoform gauze.'

Schuchardt's Operation.—This operation includes a vaginal panhysterectomy, with the addition of a vaginal incision extending from the left fornix to the introitus, and into the perineum by the rectum to the sacrum. Thus the parametria and broad ligaments are removed at either side, the ureters are exposed, and dissected down to the bladder before the broad ligaments are cut. Schauta,* who only operated on 14·7 per cent. of cases of cancer, 26·14 per cent. only of these being alive after five years, states that by Schuchardt's method the percentage of operable cases has been doubled. At the same time he is of opinion that even with Wertheim's or Freund's methods, and removal of all the lymph glands, a large number of cases must be classed as inoperable.†

Jordan (Heidelberg), Doederlein, Schuchardt, Olshausen, A. Martin, Winter, Kaltenbach, Fehling, are all advocates of the vaginal operation of hysterectomy for cancer.‡

Cancer of the Uterus in Pregnancy.—As regards the question of operation for cancer of the cervix during pregnancy, the cardinal rule should be, as Kelly well insists, when a radical operation is possible to do it without delay, in the interests of the mother. When this is not feasible, the pregnancy should be allowed to proceed to term.

Abdominal Panhysterectomy for Cancer.

The operation known by the name of the 'Ries-Rumpf-Clarke' (Kelly) involves the dissection of the ureters from out the connective tissue, possibly the upper part of the vagina and the parametric tissue. The broad ligaments and the iliac glands are also removed.

The ureters are first catheterized, either by Kelly's method or by that of Kolischer. This is done before the operation has commenced, though it may not be possible to pass the catheter from obstruction in the ureter from the inflammatory masses in which it is embedded. The cervix is now closed in the manner already described, by means of strong silk ligatures. A rather large abdominal incision is made, in order to admit of freedom of manipulation during the operation. The uterus having been exposed, the ovarian vessels and round ligaments are ligated, clamps being applied on the uterine side before the round ligament is opened.

* *Monat. f. Geb. u. Gyn.*, Feb., 1902.

† Hugo Ehrenfest, *Interstate Med. Jr.*, April, 1902.

‡ Thirtieth Congress, German Surg. Soc., Berlin, April, 1901; Winter, *Zeits. f. Geb. u. Gyn.*, bd. xliii., s. 509; Hegar's *Beitrage z. Geb. u. Gyn.*, bd. 4, heft i.; Schauta also, *Monats. f. Geb. u. Gyn.*, bd., xv., heft 2.

PLATE XLV.

Muscular
fibres and
decidua.

Ruptured
amnion
and
placenta.

Carcino-
matous
cervix.



SECTION OF UTERUS (NATURAL SIZE) AT END OF THE THIRD MONTH OF PREGNANCY WITH CARCINOMATOUS CERVIX, SHOWING DECIDUA AND RUPTURED AMNION. OPERATION VAGINAL HYSTERECTOMY.

The section was made in Halle when the author was there, and given him
by Professor Bumm. [To face p. 600.]



The ligatures are kept well away from the body of the uterus. The uterus is now incised as far as the opposite round ligament, and a similar process of ligation is carried out on this side. We proceed in the usual manner to free the lower part of the uterus from the bladder and visceral peritoneum. We next seek for the uterine artery towards its origin from the internal iliac, where it lies somewhat parallel to the ureter. The layers of the broad ligament are retracted, and the cellular tissue, as far as the pelvic floor, is separated by the handle of the scalpel. In doing this, the pulsations of the artery are felt for, and being lifted out of its bed it is carefully ligated, special pains being taken to identify the ureter at this point. Kelly says, if we catch the ureter between the finger and thumb, its flat cordlike sensation is sufficient to enable us to identify it.* It is carefully detached from the tissue, which latter is dissected down to the cervix. The large veins found on the floor of the pelvis are exposed and tied distally and proximally. Similar steps are taken at both sides. Any enlarged glands felt in the cellular tissue are dissected out along with it. The extent to which the vaginal vault is opened, and its amputation completed, will depend upon the position of the carcinoma and its extent. 'Under all circumstances,' says Kelly, 'the amputation must be made at least two centimetres below the lower margin of the disease. Before the vagina is opened, the posterior pelvis is packed with gauze, so as to receive any discharge escaping from the wound. The vagina is opened with a Paquelin knife at a dull heat, its edges being caught, as the section is made, by artery forceps. By means of an iodoform gauze pack stuffed into it, and a gauze-pad bound round the cervix, contamination of the wound is prevented, and during the entire time the greatest care is taken to prevent the dissemination of cancerous material. Other enlarged glands are now sought for and have to be removed. Irrigation of the pelvis with normal salt solution completes the operation, and a loose pack is pushed through the vagina and the opening into the peritoneum, so as to support the latter.

Wertheim's Operation.—In Wertheim's method, which I consider preferable to the last, the abdominal incision is free, and after protection of the bowel the fourth lumbar vertebra is sought for, and the ureter at one side is exposed and isolated, the recognition being

* This sensation is not always reliable. The suspicious cord should be isolated and traced upwards and backwards—the duct isolated, and the peristalsis watched for.

confirmed by the peristaltic ureteral wave. The ureters are traced down to the uterine arteries, being dissected out of any thickened tissues or carcinomatous masses. This has to be done most carefully, so as if possible to avoid injury to the ureters. The uterine arteries are secured, and the pan-hysterectomy is then proceeded with. The vaginal fornix is pushed up by an assistant, and opened from above, the pan-hysterectomy being completed in the usual manner. Before the vagina is opened, careful search is made for any carcinomatous lymph glands, and these are removed, with any involved parametric tissue.

Martin's Operation.—Martin divides the operation as performed by him into four steps:—

1. Ligaturing the base of each broad ligament, thus constricting the uterine arteries.
2. Opening the posterior cul-de-sac of the vagina, and the suturing of the peritoneum to the vaginal wall.
3. Opening the anterior cul-de-sac, and suturing the peritoneum to the vaginal wall anteriorly, by carrying the finger forwards at either side

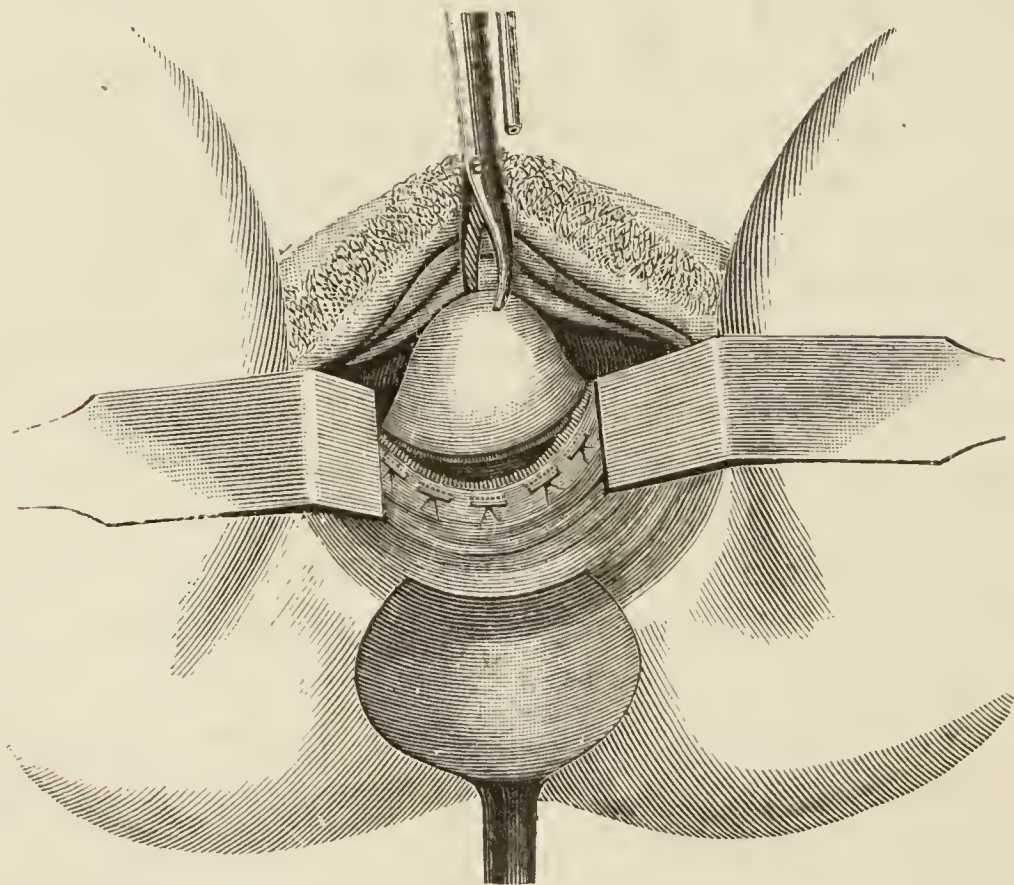


FIG. 423.—POSTERIOR CUL-DE-SAC OPENED—SUTURE APPLIED TO PERITONEUM—THE OPENING INTO DOUGLAS' POUCH AFTER THE VAGINAL WALL HAS BEEN SUTURED TO THE PERITONEUM. (A. MARTIN.)

of the uterus through the opening made in the posterior cul-de-sac, and then opening the peritoneum at either side and suturing.

4. Ligaturing the broad ligaments and dividing the structures at either side of the uterus, between the ligatures and the uterine wall.

Operation for Recurrent Cancer.—Cushing has reported cases of operation for recurrent cancer after hysterectomy. In one the bladder had to be dissected free from the vaginal tissues. After a free dissection, the glands and the adjacent tissues were removed, and the ureter dissected out, free from the broad ligament, the uterine artery tied at its origin, and the whole of the right side of the pelvis cleared out. Such operations, however, are rarely satisfactory in their results.

Extirpation of the Vagina.

This operation may be performed either by a perineal section, and removal through the perineum (Olshausen), or a vagino-perineal incision (Dührssen). The entire vagina with the uterus and ovaries may be thus removed (Martin). By a circular incision at the introitus the vagina is detached. He covers the funnel-shaped wound by drawing down the peritoneum, and attaching it to the denuded surface at the hymeneal ring.

Hysterectomy by the Sacral Method.—E. Zuckerkandl and Wölffler proposed extirpation of the coccyx and the lower portion

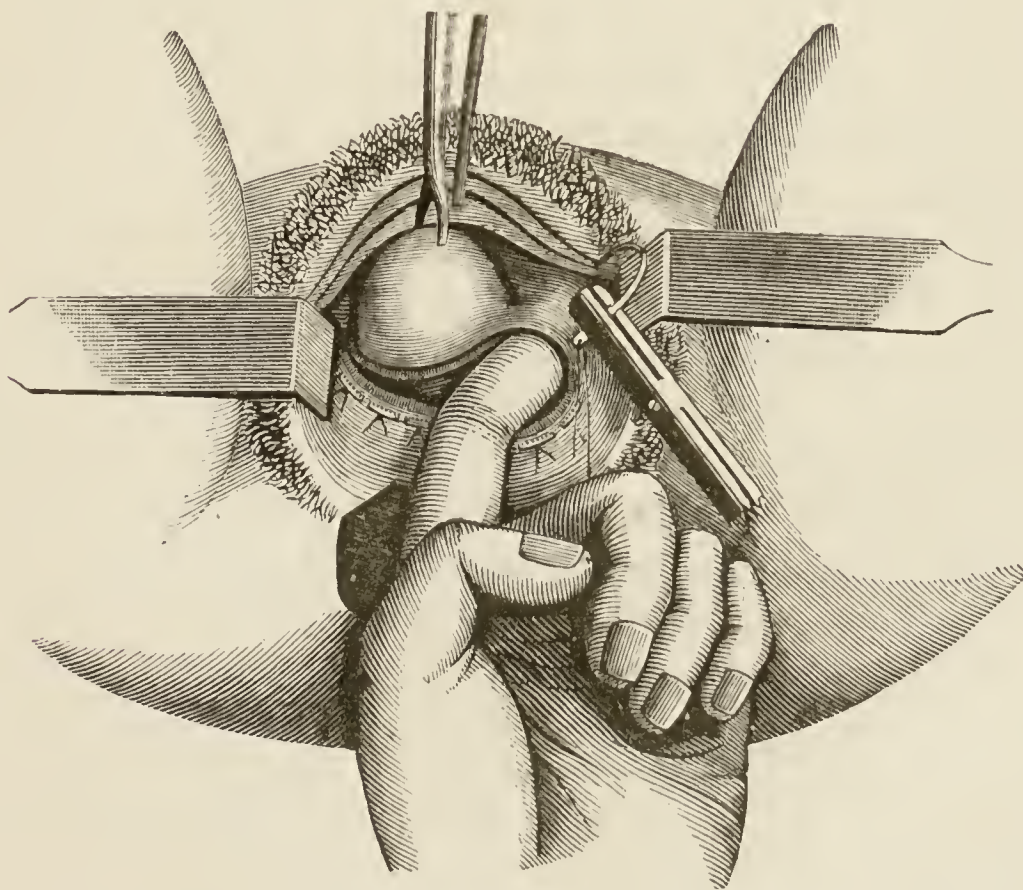


FIG. 424.—SUTURING THE LATERAL STRUCTURES IN THE PELVIC FLOOR AFTER THE OPENING OF DOUGLAS' POUCH. (A. MARTIN.)

of the sacrum. A long and curved incision is made towards the left or right side for about ten centimetres in length, stretching for

about three centimetres above the sacro-coccygeal articulation, the concavity of the curve being towards the left side. The coccyx, when divested of its periosteum, is extirpated. The necessary length of the sacrum is also removed with as little disturbance of the sacral nerves as possible. The rectum is drawn laterally, and Douglas' pouch is opened. Through this space the uterus is removed. The greatest care has to be taken to wound neither the bladder nor the ureter. Hochenegg also recorded successful operations, where the uterus was too large to remove by the vaginal method. Hegar modified the operation by converting it into an osteoplastic one, only temporarily resecting the sacrum and coccyx, and replacing these after the hysterectomy.

Electro-thermic Hysterectomy for Cancer.—Byrne removes the whole uterus, save a thin shell at the fundus, with the electric knife, reporting several successful results from the operation. Downes, after high amputation of the cervix with the electro-thermic knife, draws the fundus through a posterior vaginal incision, and applies the blades of the angiotribe to the broad ligaments outside the ovaries, then dividing the tissues on the uterine side of the angiotribe. He has operated several times by this method, not using a single abdominal ligature. Noble also has operated in the same manner, arguing that less blood is lost, that by the sealing of the lymphatics there is less risk of sepsis, and thus more of the broad ligament is removed.*

Downes argues † that more tissue can be removed outside the uterus by electro-thermic hysterectomy than by other methods; ‡ vessels and lymphatics are rendered non-absorptive, and danger of implantation is lessened, while a bloodless field is left after operation. Downes uses three angiotribes, with different-sized blades, varying in width. The current is under the control of a transformer, and arranged in the operating-room both for the alternating and continuous currents. One part of the cable connects the current with the operating-table, and another the instruments at the edge of the table. The platinum cautery blade of the knife should be of the same amperage as will heat the blade of the angiotribe, thus serving as an index of the strength of the current, or a meter may be included in the circuit.

* *Amer. Med.*, May, 1902.

† *Amer. Gyn.*, Dec., 1902.

‡ See pages 497–501 for description of hysterectomy by means of the electro-hæmostatic angiotribe.

